



Board of Directors Meeting

Open Session Agenda

Sunday, February 5, 2023 | 1:30 - 5:30 pm ET (UTC-05:00)
Omni CNN Center Atlanta | Grand Ballroom D2/E (M4-North)
Business Attire

****BOD GROUP PHOTO AT 1:20 PM ET****

1. **CALL TO ORDER** - Mehboob
2. **CODE OF ETHICS** - Mehboob

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 shall avoid all real or perceived conflicts of interest.

(Code of Ethics: <https://www.ashrae.org/about/governance/code-of-ethics>)

(Core Values: <https://www.ashrae.org/about/ashrae-s-core-values>)

3. **ROLL CALL/INTRODUCTIONS** - Mehboob
4. **REVIEW OF MEETING AGENDA** - Mehboob
5. **APPROVAL OF MINUTES** - Mehboob
 - A.* August 15, 2022
 - B.* October 13-14, 2022
 - C.* December 6, 2022
6. **REVIEW OF ACTION ITEMS** - Mehboob
 - A.* June 29, 2022
 - B.* August 15, 2022
 - C.* October 13-14, 2022
7. **OPEN SESSION - Addresses to the Board of Directors**
8. **NOMINATING COMMITTEE REPORT** - Chuck Gullledge
9. **TREASURER'S REPORT** - Knight
 - A.* 2022-23 Financial Update
 - B.* Financial Statements and Major Variations - December 2022
 - C.* Finance Committee Report

- 10. COMMITTEE REPORTS**
 - A. Executive Committee - Mehboob
 - i.* October 14, 2022
 - ii.* November 1, 2022
 - iii.* February 4, 2023
 - B.* Planning Committee - Macauley (Stephanie Kunkel)
 - C.* Building EQ - Maston (Michael Deru)
- 11.* BOD STRATEGIC PLANNING RETREAT - Khankari**
- 12.* ASHRAE GLOBAL HVAC SUMMIT FINAL REPORT – Mehboob (Tim Wentz)**
 - A. Future Summits and International Conferences – Sepulveda and Knight
- 13.* INDUSTRY ROUNDTABLE STRATEGIC DISCUSSION – Scoggins**
- 14. LOWERING FINANCIAL BARRIERS FOR VOLUNTEER PARTICIPATION – Mehboob /Macauley**
- 15. BOD SUBCOMMITTEE REPORTS**
 - A.* DEI Advisory – Thomle
 - B.* Financial Focus – Knight
 - C. Strategic Business Development – Macauley
 - D.* Society Streamlining - Maston
- 16. PRESIDENTIAL AD HOC COMMITTEE AND BOD TASK GROUP REPORTS**
 - A.* Building Decarbonization ExCom – Scoggins (Kent Peterson)
 - B. International Standards Interaction – Knight (Drake Erbe/Steve Bushby)
 - C.* ASHRAE Brand Recognition - Khankari
 - D.* HQ Building Ad Hoc – Scoggins
 - E.* Efficient and Healthy Schools Program Partnership with DOE – Constantinide
- 17. EXECUTIVE SESSION (Separate Agenda)**
- 18. APPOINTMENTS UPDATE (SINCE JUNE 2022) - Mehboob**
 - A.* Standing Committee Appointments & Election
 - B.* Presidential Appointments
- 19. INFORMATION ITEMS - Mehboob**
 - A. Report of the President
 - B.* Standards Analysis Sheets - February 2023

20. OLD BUSINESS

A.

21. NEW BUSINESS

A.

22. UPCOMING MEETINGS

Wednesday, February 8, 2023 | 2:00 - 6:00 pm ET | Omni | Grand Ballroom D2/E (M4-North)

Spring Conference Call | March 27, 2023 | 11:00 am – 1:00 pm ET

23. ADJOURNMENT



MINUTES

BOARD OF DIRECTORS MEETING

Monday, August 15, 2022

Note: These draft minutes have not been approved and are not the official record until approved by the Board of Directors.

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PRINCIPAL APPROVED MOTIONS

Board of Directors Meeting

Monday, August 15, 2022

No. - Pg.	Motion
1 – 2	The open session minutes from the June 26, 2022 and June 29, 2022 Board of Directors' meetings be approved.
2 – 4	<p>The following six motions be accepted as a consent agenda</p> <ul style="list-style-type: none"> i. Standards Committee recommends that BSR/ASHRAE/IES Addendum <i>ag (System Performance Path)</i> ANSI/ASHRAE/IES Standard 90.1-2019, <i>Energy Standard for Buildings Except Low-Rise Residential Buildings</i>, be approved for publication. ii. Standards Committee recommends that BSR/ASHRAE/IES Addendum <i>ap (Energy Credits)</i> ANSI/ASHRAE/IES Standard 90.1-2019, <i>Energy Standard for Buildings Except Low-Rise Residential Buildings</i>, be approved for publication. iii. Standards Committee recommends that BSR/ASHRAE/IES Addendum <i>ar (Horticultural Lighting)</i> ANSI/ASHRAE/IES Standard 90.1-2019, <i>Energy Standard for Buildings Except Low-Rise Residential Buildings</i>, be approved for publication. iv. Standards Committee recommends that BSR/ASHRAE/IES Addendum <i>ay (VRF Updates)</i> ANSI/ASHRAE/IES Standard 90.1-2019, <i>Energy Standard for Buildings Except Low-Rise Residential Buildings</i>, be approved for publication. v. Standards Committee recommends that BSR/ASHRAE/IES Addendum <i>ba (Interior Lighting Controls and Space-by-Space LPDs)</i> ANSI/ASHRAE/IES Standard 90.1-2019, <i>Energy Standard for Buildings Except Low-Rise Residential Buildings</i>, be approved for publication. vi. Standards Committee recommends that BSR/ASHRAE/IES Addendum <i>cc (On-Site Renewable Energy)</i> ANSI/ASHRAE/IES Standard 90.1-2019, <i>Energy Standard for Buildings Except Low-Rise Residential Buildings</i>, be approved for publication.
4 – 9	<p>MOTION 3:</p> <p><i>The BOD DEI Advisory Subcommittee recommends to the ASHRAE Board of Directors consider issuing a response to the request from Society of Women Engineers of coordinating efforts between ASHRAE and AIA on a Building Industry Statement to address the recent ruling overturning Roe vs. Wade.</i></p> <p>be postponed until the October 13-14, 2022 BOD meeting.</p>

ACTION ITEMS

Board of Directors Meeting

Monday, August 15, 2022

No. - Pg.	Responsibility	Summary of Action	Status	Goal Date
1 – 3	Littleton and Macauley	Adjust the payments to members analysis to indicate what portion of payments are reimbursement for travel.		



MINUTES

BOARD OF DIRECTORS MEETING

Monday, August 15, 2022

MEMBERS PRESENT:

Farooq Mehboob, President
Ginger Scoggins, President-Elect
Billy Austin, Vice President
Dunstan Macauley, Vice President
Sarah Maston, Vice President
Ashish Rakheja, Vice President
Jeff Littleton, Secretary
Steven Sill, Region I DRC
Ronald Gagnon, Region II DRC
Mark Tome, Region III DRC
Bryan Holcomb, Region IV DRC

Jim Arnold, Region V DRC
Susanna Hanson, Region VI DRC
Chris Gray, Region VII DRC
Tyler Glesne, Region IX DRC
Devin Abellon, Region X DRC
Eileen Jensen, Region XI DRC
John Constantine, Region XII DRC
Cheng Wee Leong, Region XIII DRC
Andres Sepulveda, Region XIV DRC
Richie Mittal, RAL DRC
Blake Ellis, DAL

Luke Leung, DAL
Wei Sun, DAL
Dru Crawley, DAL
Ken Fulk, DAL
Art Giesler, DAL
Wade Conlan, DAL
Kishor Khankari, DAL
Adrienne Thomle, DAL

GUESTS PRESENT:

A. Praveen
Abbas Sajid
Abdul Rehman
Abdulrahil Kalendar
Ade Awuioola
Afzaal Malik
Ahmed Alaa Eldin
Ahmed Gulzar
Triantafyllos Andreas
Triantafyllopoulos
Altaf Safar
Ammad Monus
Ammar Bahman
Anoop Peediyakkan
Asif Khan
Atam Hayat
Ather Naseem Siddiqui
Atilla Biyikoglu
Babatunde Badru
Bassel Anbari
Bilal Javed
Chad Smith
Dalip Singh
Danish Tahir

Danyal Butt
Doug Cochrane
N. Kaplan
Manoj Gupta
Rashid Alshatti
Emeka Achebe
Yaqoub Almatouq
Fahim Ishaq
Farman Khan
Ghassan Al Ali
Goutham Pitchikala
Harrison Kesling
Hossam Hassaan
Hugh Crowther
Ibad Hasan
Jayson Bursill
Jennifer Leach
Jonathan Smith
Julia Timberman
Kay Thrasher
Khawaja Khalid Iqbal
Khurram Raja
Krishna Mitra
Lukasz Semla
Mahesh Prabhu

Mahroo Eftekhari
Manoj Khati
Mehiar Asfari
Mirza Adnan
Mirza Ajmal Sharif
Mobarak Alqenaee
Mohammed Murtaza
Mohsin Ashraf
Moiz Ashraf
Money Khanna
Monica Del Fresno
Mohammad Riaz Baig
Mohammed Zahir
Muhammad Aamir
Muhammad Farooq Saeed
Muhammad Mohsin
Muhammad Zubair
Nitin Naik
Nivedita Jadhav
Noman Qamar
Numan Ghani
Olubukunmi Olatunbosun
Om Taneja
Omer Khan
Pallab Kar

GUESTS PRESENT:

Pankaj Sareen	Shankar Sapaliga	Tom Watson
Ramzan Saeed	Shaun Nien hueser	Trent Hunt
Rick Hermans	Shuja Khalid	Usman Abdulrahman
Rupesh Umtol	Sohan Lal Kumawat	Usman Tariq Chughtai
Safdar Ali	Spencer Morasch	Van Baxter
Sayani Sri Haribabu	Sreekanth KJ	Wael A. Eid
Serafin Grana	Srinivas K.	Waqar Ali Shah
Shabab Qamar	Syed Rafiullah	Wimala Goonaratne
Shahrukh Manzoor	Tapan Roy	Yeshwant Karkhanis
Shailendra Kasera	Tom Phoenix	

STAFF PRESENT:

Candace DeVaughn, Manager - Board Services
Chandrias Jolly, Assistant Manager - Board Services
Joyce Abrams, Director - Member Services
Vanita Gupta, Director - Marketing
Kim Mitchell, Chief Development Officer
Mark Owen, Director - Publications & Education
Stephanie Reiniche, Director - Technology
Alice Yates, Director - Government Affairs
Craig Wright, Director of Finance
Connor Barbaree, Sr. Manager - Technology

CALL TO ORDER

Mr. Mehboob called the meeting to order at 8:00 am.

CODE OF ETHICS

Mr. Mehboob read the code of ethics commitment and advised that the full code of ethics and core values are available on ashrae.org.

REVIEW OF MEETING AGENDA

Mr. Mehboob reviewed the meeting agenda. There were no changes or additions.

APPROVAL OF MINUTES

Mr. Macauley moved and Mr. Gagnon seconded that

1. The open session minutes from the June 26, 2022 and June 29, 2022 Board of Directors' meetings be approved.

MOTION 1 PASSED (Unanimous Voice Vote, CNV).

EXCOM REPORT TO THE BOD**JUNE 29, 2022**

Mr. Mehboob reported that there were no recommendations for the BOD's consideration.

He reported that ExCom received reports from all bodies reporting to ExCom. He stated that ExCom had a brief discussion on scope three emissions.

JUNE 30, 2022

Mr. Mehboob reported that there were no recommendations for the BOD's consideration. He reviewed the information items.

Mr. Mehboob reviewed ExCom's discussion of payments to members. He reported that 130 payments were made last Society Year, with the average payment being approximately \$3,918. He stated that what he found concerning was that four of the five highest paid members, who were cumulatively paid \$229,000, were BOD members. He reported that no decisions were made by ExCom as of yet.

Mr. Conlan suggested that fees paid out of Society's budget be separated from fees paid by other organizations via contract work. For example, work has been done and paid for by NYSERDA.

Mr. Mehboob responded that Mr. Conlan's comments were excellent and the more data available, the better.

Mr. Crawley suggested that travel reimbursement payments be broken out to better understand what payments are travel reimbursements and which are payments for courses.

Staff and Mr. Macauley will adjust the payments to members analysis to indicate what portion of payments are reimbursement for travel.

AI - 1

Mr. Khankari asked for additional information on the AIA MOU. He asked what Society's plans are for implementation so that the BOD can understand the progress on that MOU.

The AIA Liaison Committee members were shown on screen.

Mr. Littleton reported that he, coincidentally, had a recent meeting with Lakeisha Woods, the new AIA Executive Vice President. One of the interesting things that came up with Mr. Littleton's meeting with Ms. Woods is that AIA is open to co-sponsoring an ASHRAE Standard. If this possibility were to move forward, it could result in greater pick up and awareness of ASHRAE Standards moving forward.

He reported that the relationship with AIA is great and quite strong, and the AIA liaison group has been quite strong as well.

Ms. Abrams reported that the relationship with AIA is ongoing, for example, participation on each other's committees.

TECHNOLOGY COUNCIL REPORT

Ms. Maston reported on behalf of Technology Council. She reminded members of the BOD to review the forthcoming motions for adherence to ASHRAE's Procedures for Standards Actions (PASA) and ANSI

Essential Requirements and not technical content. If the BOD disapproves a Standards Committee Document for publication, please detail reason(s) for the record.

She reported that the publication motions presented are addenda that have unresolved objectors, negative project committee votes with reason, or a threat of legal action. These motions are preceded by formally voted recommendations from the project committees and Standards Committee. The rules do not require a vote from Technology Council. Appeals procedures now allow for consideration of an appeal of a BOD standards action or inaction only if the negative vote or unresolved comment is based solely upon procedural grounds.

Ms. Maston reported that consent motions one through six have unresolved commenters or negative committee votes but no negative votes by Standards Committee. The reasons for the negative votes were technical in nature with no alleged process violations subject to appeal. Please refer to the analysis sheets for the full detail on the reasons for negative votes and/or unresolved commenters and a summary of Project Committee responses that were distributed prior to the meeting.

Ms. Maston moved that

2. The following six motions be accepted as a consent agenda
 - i. Standards Committee recommends that BSR/ASHRAE/IES Addendum *ag (System Performance Path)* ANSI/ASHRAE/IES Standard 90.1-2019, *Energy Standard for Buildings Except Low-Rise Residential Buildings*, be approved for publication.
 - ii. Standards Committee recommends that BSR/ASHRAE/IES Addendum *ap (Energy Credits)* ANSI/ASHRAE/IES Standard 90.1-2019, *Energy Standard for Buildings Except Low-Rise Residential Buildings*, be approved for publication.
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 - iv. Standards Committee recommends that BSR/ASHRAE/IES Addendum *ay (VRF Updates)* ANSI/ASHRAE/IES Standard 90.1-2019, *Energy Standard for Buildings Except Low-Rise Residential Buildings*, be approved for publication.
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 - vi. Standards Committee recommends that BSR/ASHRAE/IES Addendum *cc (On-Site Renewable Energy)* ANSI/ASHRAE/IES Standard 90.1-2019, *Energy Standard for Buildings Except Low-Rise Residential Buildings*, be approved for publication.

MOTION 2 PASSED (Unanimous Voice Vote, CNV).

ASHRAE BRAND RECOGNITION

Mr. Mehboob reported that 'ASHRAE Brand Recognition' was an initiative started under Mr. Schwedler's Presidential year. The name of the group has been adjusted slightly. The group has done a great deal of work and has been led by Mr. Khankari.

Mr. Khankari reported that the work of the group was completed a while ago. He thanked the members for their time.

He presented the group's report. The full report was attached to the agenda.

Mr. Mehboob opened the floor to questions and comments and requested that they be addressed to Mr. Khankari.

Ms. Gupta shared what the Society is already doing as it relates to the recommendations. She provided the following updates:

- On average 50-60 press releases are sent each year to members, non-members, 800 media contacts across the globe, MOU associations, and AASA members.
- 50% of the Society's social media followers are non-members.
- The ASHRAE 365 app has 30,000 users.
- 70 emails are sent annually from Society to members and non-members and the typical distribution is 100,000.
- The weekly HVAC Newsletter is sent to 92,000 recipients.
- Society has an ASHRAE Podcast as well as a YouTube channel.
- The ETF was sourced to do over 700 media news articles which reached 11 billion people, who were largely the general public.
- When 'ASHRAE' is put in the Google search field, our metrics show that Society is the first thing that comes up. For searches that do not include 'ASHRAE,' Google analytics can be conducted.

Mr. Mehboob thanked Ms. Gupta for the information and stated that the Marketing Department is doing a great job. He stated that Mr. Khankari and his group are suggesting another approach. Do we offer products and services that have a wider outreach? Do we determine if the Marketing team needs more resources? Where else can we branch out?

Mr. Khankari stated that the Marketing Department is doing outstanding work. He reported that the work of the group is forward looking at how the Society can remain relevant in the next 50-100 years. He reported that in order for Society to remain relevant in that time, what is currently being done must be added to.

Ms. Gupta was asked how the Marketing team could contact all councils and committees. She reported that the Marketing team would have to determine how best to do that.

Mr. Gray stated that all of the updates provided by Ms. Gupta is outreach to groups that already understand Society and the ASHRAE brand. He suggested that Society work to reach those that may not get the current media outreach. For example, major media outlets.

He stated that there was just life changing legislation for decarbonization in the US and Society ought to be out there discussing the role that buildings play and addressing each of those items of legislation.

Mr. Gray suggested that video content, in addition to written content, is needed.

Mr. Sun suggested that efforts be linked to grassroots PAOE.

Mr. Rahkeja stated that the group deliberated on the need for spreading the word about Society. He stated that the challenge put forward was not just for the US. He suggested that the topic needs far more deliberation and support from staff.

Mr. Littleton stated that there is a great deal of passion from the BOD on this subject. He stated that it is important that this be a staff/volunteer partnership. He suggested that it was a missed opportunity to take advantage of the wisdom of the Marketing team as these recommendations were developed.

Mr. Khankari responded that this was the very first attempt towards this subject and the group was just brainstorming some ideas. He stated that on a long-term basis he agrees that the staff/volunteer partnership is important. He reported that he did reach out to Ms. Gupta regarding these activities. He expressed agreement with Mr. Littleton that the long-term plan should include a staff/volunteer partnership.

Mr. Rakheja stated that from the discussions, there is strong agreement that recommendations from staff would have been useful. He suggested that more work be done on this topic.

Mr. Mehboob stated that this topic will go forward and staff will be involved. He stated that he is a strong advocate of the staff/volunteer partnership and expressed that the partnership will yield the best results moving forward. He stated that he will present a plan to the BOD in the future.

DEI SUBCOMMITTEE REPORT

Ms. Thomle apologized for the report not being attached to the agenda. The full report is included in ATTACHMENT A.

Ms. Thomle moved that

3. The BOD DEI Advisory Subcommittee recommends to the ASHRAE Board of Directors consider issuing a response to the request from Society of Women Engineers of coordinating efforts between ASHRAE and AIA on a Building Industry Statement to address the recent ruling overturning Roe vs. Wade.

Ms. Thomle reported that in response to feedback from SWE's membership, the organization issued a statement on their website regarding the change in US policy. Beth Thomlinson from Region VI, representing SWE, requested that efforts be coordinated between ASHRAE and AIA on a Building Industry Statement to address the recent ruling overturning Roe vs. Wade.

She reported that the consensus of the BOD DEI Advisory Subcommittee was that this issue was important and at a minimum warrants discussion at the BOD level. The BOD DEI Advisory Subcommittee

acknowledges that this is a nuanced topic for ASHRAE to address without the appearance of ASHRAE involving itself in political matters.

Ms. Thomle spoke against the motion. She stated that ASHRAE is an international society and should not be involved in one country's political issues.

Mr. Mehboob set the parameters of the discussion. He stated that this was not the first case that had come before the BOD, requesting that Society address what is fundamentally a social issue. He requested that BOD members focus comments on whether Society should be involved in these types of matters, no matter where they come from.

He stated that the fundamental issue before the BOD is, is Society in the business of addressing social issues? A summary of that discussion is below:

Spoke against the motion. Society did not take a stance on the conflict in Ukraine. Other countries have differing views on not just abortion, but other topics as well. (Arnold)

Expressed agreement with the previous comments. Society should not be engaged in this area of DEI. (Leong)

Spoke against the motion. (Constantinide)

Neither for nor against the motion. The BOD is not really voting on what Society should say and a statement does not necessarily need to take a position. One possibility is to state the Society's apolitical stance, but acknowledge the challenges posed to our constituents. The statement could acknowledge that members are sincerely and viscerally impacted by this. This could be an opportunity to articulate a lot of the principles that Society has adhered to. (Hanson)

Spoke against the motion. Tend to think that when Society gets involved in political and social issues, it exposes the organization to criticism and possibly alienating members. This is a mine field that we should not step onto. Making a statement is taking a position. (Fulk)

Spoke against the motion. The way I read the motion is it is not Society's statement, but it is a building industry statement that Society's name would be attached to. If Society does make a statement, it should be on our own. (Ellis)

Undecided on the motion. The motion is requesting that the BOD consider issuing a response to the request. Suggest a courteous response to SWE that we choose not to make a statement at this time. (Jensen)

Spoke in favor of the motion as written. Heard a lot of comments as to whether this is a social or political issue and something that we need to be careful with. The DEI Subcommittee was created to ensure that all people and members have the same opportunities, and this ruling does have an impact on a certain demographic. At the very least, Society should consider issuing a response. (Abellon)

Toying with the idea that this be postponed until the next BOD meeting. Mr. Mehboob asked a broader question at the start of this discussion that needs more thought. Also need more time to

read both SWE's response as well as Society's diversity commitment to formulate my thoughts. (Gray)

The motion is just requesting that Society issue a response to SWE. (Austin)

Agree that the motion should be postponed. Need to delay so BOD members have time to process. The issue is multifaceted on so many levels and BOD members need the opportunity to review what is going on. (Maston)

Mr. Mehboob reminded the BOD that he is limiting the discussion on whether Society should be involved in these types of discussions – issuing statements, taking political stances, etc. There are over 130 countries represented in ASHRAE. If people want a long list of social and political issues it will be a never-ending list. He stated that he wants to first establish if Society is in this game. If the BOD determines that Society is in the game, the discussion can be postponed to a later BOD meeting.

Discussion resumed.

Expressed agreement with Mr. Mehboob. Spoke against the motion. It is odd to pick on a Supreme Court decision and want to respond to that. There are many supreme court decisions on this topic. By choosing to respond to this Supreme Court decision it would show Society's priority. (Leung)

Is a human rights issue and will likely not be the only one we are brought. Would like to charge the DEI Subcommittee to come up with draft language. (Glesne)

Wish to not go down the road as it relates to human rights. Not relevant to ASHRAE. Human rights are a slippery slope in my opinion. (Mehboob)

Any statement made at this point in history related to eliminating barriers to having women in the work force will be seen as the Society choosing a side in the Roe vs. Wade debate. Concerned about Society taking that position. Feel we could lose thousands of members. Also have to be cautious with our mission as it relates to being a 501(c)3; there are IRS guidelines that require Society to stay in line with our core purpose. Having said that, work force development is a front and center issue for ASHRAE. There are ways we could do that but we would have to be cautious about that and take into account our mission and 501(c)3 status. (Littleton)

Could one of our members petition the IRS and notify them that ASHRAE is participating in these types of activities? (Mehboob)

Yes, if Society were to hypothetically issue a generic statement and if some members perceived us as taking a side on the Roe vs. Wade issue, they could report Society to the IRS. If enough people did that, the IRS could do an investigation. (Littleton)

Agree with the previous comments. ASHRAE is a technical society, not political or religious. (Sun)

Personal opinion aside, when I look at this motion, feel that Society should respond, and it should be neutral. Would like to see the statement before voting. Our DEI is focused on ASHRAE, not

larger issues outside of our Society. Owe SWE a response one way or the other; no response will be just as loud as a response one way or another. (Conlan)

There are two issues that have been brought up, one is setting a strategic direction for ASHRAE on how we address social issues, and the other is the motion on the floor. To me, it seems most prudent to postpone the motion and add the strategic issue as a discussion point. (Jensen)

Ms. Jensen moved and Mr. Macauley seconded that

4. MOTION 3:

The BOD DEI Advisory Subcommittee recommends to the ASHRAE Board of Directors consider issuing a response to the request from Society of Women Engineers of coordinating efforts between ASHRAE and AIA on a Building Industry Statement to address the recent ruling overturning Roe vs. Wade.

be postponed until the October 13-14, 2022 BOD meeting.

MOTION 4 PASSED (Unanimous Voice Vote, CNV).

Mr. Mehboob asked the DEI Subcommittee to present a report on activities between the Toronto meeting and now. He requested that the report be submitted by the Spring BOD Meeting. The written report will be circulated to the entire BOD.

Ms. Thomle reported that the DEI Subcommittee is planning on having a panel, forum, or workshop at every Annual and Winter Conference. For the January 2023 Conference, a cultural workshop has been approved.

She reported that the subcommittee is continuing to work with the consultant to provide additional training and videos to members and chapters.

She reported that Mr. Khankari and Ms. Hayter have organized a book club to discuss *Blind Spot*; the first two chapters will be discussed in September and the third and fourth will be discussed in October.

Mr. Khankari reported that the first book club meeting will be September 23 at 11:00 am ET. All BOD members will receive a meeting invite. He requested that all BOD members attend. He reported that a representative from MP will be in attendance as well. He reported that Mr. Knight will be sharing his thoughts on the first two chapters and Ms. Hayter will lead discussion of chapters three and four.

Mr. Mehboob thanked the DEI Subcommittee for their great work.

STRATEGIC BUSINESS DEVELOPMENT SUBCOMMITTEE REPORT

Mr. Macauley presented on behalf of the subcommittee. The full report is included in ATTACHMENT B.

He reported that the subcommittee has not had a formal meeting as of yet, but they have started initial brainstorming on the work plan.

Mr. Macauley presented the first version of the work plan.

Mr. Mehboob requested, and Mr. Macauley confirmed, that a timeline will be created to accompany the presented work plan.

Mr. Macauley stated that this is a key subcommittee. He opened the floor for discussion and noted that there is nothing like collective wisdom. Below is a summary of the discussion:

Suggestion to look at the international level as well. RAL translated some standards and would be happy to assist. (Mittal)

Four members have been contacted to provide a global perspective as well as young engineers' perspectives related to where Society goes from here. Global perspective is huge and leadership recognizes it is a growing sector of our industry. (Mehboob)

Surprised at the task. BOD members should think more strategically and assign this item to Pub and Ed Council. What we need to see is beyond products and services. Why can't all these tasks be assigned to Pub and Ed Council? (Khankari)

Anything that generates revenue is a product or service. Kept it to that broader term because that is what will generate revenue. (Mehboob)

Agree with the previous comments but the tasks listed can be assigned to Pub and Ed Council. The BOD needs to think more strategically. (Khankari)

Urge you to review the charge to this subcommittee. The intention is not to consider publications individually. Society is faced with lots of opportunities. For example, Society is not currently doing business to business or electronic services. The thinking here must be strategic. Many of the areas of focus can go to Pub and Ed Council, which is why Mr. Macauley is chairing the subcommittee. In broad terms, products and services are all of the opportunities that exist, much of which has not been done. (Mehboob)

Goes hand in hand with having CRC roundtables and getting feedback from market leaders. Need the information from the market, not just from the membership, and these roundtables could be a way to gain that information. (Sepulveda)

Think it is good to reach out to members but there is a huge market beyond the 50,000 members. A lot of other societies have large memberships and there are opportunities globally for us to draw revenue from. (Crawley)

FISCAL FOCUS SUBCOMMITTEE REPORT

Mr. Crowther presented on behalf of the subcommittee.

Mr. Crowther reported that the subcommittee is not proposing that all decisions need to be determined by money, but at the same time the BOD needs to understand financial commitments. Need to make sure that the requests are in line with the risk the Society is signing up for.

Mr. Giesler reported that he already contacted staff and council leaders for their feedback and input. The subcommittee will evaluate the feedback and come back to the BOD with a proposal.

Mr. Crowther reported that this is streamlining and empowering the organization to make the right decisions at the right level.

He stated that the subcommittee is conscious of not making these tools so onerous that nobody brings new ideas forward. If we ask our people to make sure we understand what is being proposed, then we can assist with clarifying the financial implications.

He stated that if Society has good analytics, it will allow decision makers to understand how ASHRAE is financially performing. This will empower the BOD, councils, and committees.

Mr. Crowther reported that the subcommittee created three working groups. The full subcommittee has already had its first meeting, which the Finance team attended.

Mr. Mehboob stated that this task was very important to securing the Society's future. He thanked the subcommittee for coming to the BOD for thoughts and input. He asked BOD members to share their thoughts, ideas, and comments.

Mr. Crawley stated that this was a great step forward. One comment is to include some scope of level of volunteer effort.

Mr. Khankari asked that the new tool be made as simple, easy, and clear as possible. He asked, what exactly are the fiduciary responsibilities of BOD members? He expressed his hope that this group will train the BOD. He suggested that the subcommittee create a training module that can be a permanent training module for BOD members.

Mr. Mehboob thanked Mr. Crowther and the subcommittee for their work and effort.

STREAMLINING SUBCOMMITTEE

Ms. Maston reported on behalf of the subcommittee. She stated that the report would be very informal.

She stated that from her experience several years ago, this is an important topic to President Mehboob.

She reported that the subcommittee had met twice and was struggling to find a good day and time when everyone can meet.

She reported during their first meeting that they looked through the materials that other streamlining groups had presented. They also looked through the BOD motion and presentation that is being given at the regions. She stated that it was not the task of the group to continue the work of the previous groups, but she wanted to ensure that all subcommittee members understood what was on the table.

She reported that she also reached out to Mr. Crowther, who is the best person she knows that does lean presentations.

She reported that the subcommittee is looking at this topic from the council level to better understand what the councils have already done and what still needs to be done.

DISCUSSION ON BOD COMPOSITION AND LEADERSHIP

Mr. Mehboob stated that he placed this item on the agenda because of the pending motion that will be voted on in Istanbul. He stated that it is important in the interim that the BOD fully understand. Directors will have the opportunity to have their concerns addressed.

He stated that Mr. Macauley and his group have worked hard to provide very detailed responses to all directors' concerns. All BOD members have received this list of concerns and comments.

He stated that he would first like to have the directors who made comments give a brief overview of their comments or concerns and allow Mr. Macauley to address them.

Mr. Glesne stated that he did not prepare responses to the responses and had no follow up questions or comments. He stated that he reviewed the comments that were submitted in writing. He stated that he foresees the international regions expanding beyond the few that Society currently has.

Mr. Macauley stated that Mr. Glesne made a good point. He stated that the subcommittee was determining feasibility. If the proposed motions pass, Members Council will be asked to review and make recommendations. He stated that the proposed structure is meant to facilitate growth and the group wanted it to be flexible enough for growth.

Mr. Macauley reported on the subcommittee's plans to conduct Society wide town hall meetings.

Mr. Mehboob asked why the subcommittee did not decide districts ahead of time. He suggested that members may be hesitant to support the plan until those decisions are made.

Mr. Macauley responded that the subcommittee felt it was important to make decisions related to the districts as close to the grassroots as possible. He reported that, if approved, there would be an eight to ten year transition period and that there was no way all of the necessary details could be decided at once. Which is why a Transition Ad Hoc was recommended, to manage the process. The Transition Ad Hoc and Members Council will make recommendations to the BOD. If the BOD feels this task is critical at this juncture, Members Council could be tasked with making recommendations.

Mr. Conlan stated that there was more than one way for those regional relationships to be organized and the subcommittee felt that decision was best made by Members Council. He stated that Members Council would be provided a framework and it would then be up to them to develop a plan to meet requests.

Ms. Scoggins reported that there will be a Members Council meeting in September where the council will begin discussing possibilities.

Mr. Mehboob stated his opinion that preliminary thinking will be very helpful.

Mr. Macauley reported that the subcommittee discussed ExCom at length. The subcommittee's recommendation was that Society needs the ability to handle issues in between BOD meetings. He

reported that the Bylaws state that the BOD shall appoint an ExCom, providing flexibility for who sits on ExCom.

Mr. Ellis stated that his comments were to point out that Nominating Committee reports to the membership. He stated that his second comment was on a better way to create a graphic.

Ms. Thomle stated that she appreciated the response regarding districts. She expressed concern that District Directors would have a lot of responsibility and suggested that they should have chapter and Members Council experience.

Mr. Macauley responded that the subcommittee wanted to empower the chapters to make those decisions. He stated that if the ARC was not appointed by the President, that member would not be able to sit in as proxy.

Ms. Thomle stated that she would specifically like to see separation between names for directors.

Mr. Fulk stated that some of his questions had already been answered. He expressed agreement that the ARC should be a President-Elect selection.

Mr. Macauley responded that the recommendation is that regional chairs be selected by the regions. Based on the current rules, each region would put a name forward for District Director, the Nominating Committee would get up to three names to evaluate and would then make a recommendation to the membership for one name.

Mr. Macauley reported that at least nine more regions would have to be added before a new district would need to be created.

Mr. Fulk expressed concern with one region dominating regional director.

Mr. Macauley responded that the group wanted to stay away from quotas. The subcommittee felt that Nominating Committee would be a neutral body to select the best candidate. In the Society's current structure, there is no way to prevent one chapter from dominating DRC. Regions can work out their own succession plan if they so choose. He reported that the subcommittee did not want to restrict them but wanted to be sure there was the ability to put names forward and allow a neutral body (Nominating Committee) to resolve any conflicts.

Mr. Khankari stated that his biggest concern was not seeing a connection between what is being done and why. He stated that he would look through Mr. Macauley's comments. He suggested that there was no logic presented for reducing the number of DALs. He suggested that response and input was needed from the Technical Committees. He suggested that exercise needed to be looked at holistically.

Mr. Constantinide summarized his written comments, expressing his concern with the optics of the activity. He suggested that the districts be embedded into the BOD and expressed his opinion that interaction between the two was very important.

Mr. Macauley responded that the subcommittee did not want to add another layer. He stated that the subcommittee's recommendations are not to reduce the size of the BOD, instead, the recommendations are to improve operational efficiencies. He stated that DRCs are wearing the hats of society director and

regional chair; both of which tend to be full time hats. He stated that a district director, sitting on the BOD, could interface with the member firms in the area and would be an interface between the BOD and the regions.

Mr. Gray stated that his comments were around looking at ExCom and looking at whether four Vice Presidents are needed. He stated that overall, there is support in his region to reorganize the BOD. He stated that members felt the reorganization did not impact them so long as they had the ability to select their representative.

He suggested that there be clear written guidelines for ExCom and BOD responsibilities.

Mr. Mittal stated that he felt his comments had been addressed.

Mr. Macauley reported that the number of districts are flexible. He stated that the number of districts needs to be a discussion and the subcommittee wanted to have that discussion.

Mr. Rakheja stated that the Region XII submitted comments after Mr. Macauley's presentation and they were well responded to. He added a concern that came up from Region XII that they feel they are an international region as they represent all of South America. He shared the Region's strong fear that if the international regions are combined Region XII's voice might get lost. He suggested that this point should be emphasized when Members Council looks at districts.

Mr. Mehboob stated that he was positive and hopeful that the BOD might be seeing the end of the road. He thanked the subcommittee for their work. He stated that the subcommittee has done a fantastic job.

EXECUTIVE SESSION

Executive session was called at 11:34 am.

Open session reconvened at 11:43 am.

INFORMATION ITEMS

Mr. Mehboob reported that analysis sheets were attached for the BOD's review and covered as part of Technology Council's report to the BOD.

UPCOMING MEETINGS

Mr. Mehboob reported that the next BOD meeting would be October 13-14, 2022 in Istanbul, Turkey.

ADJOURNMENT

The meeting adjourned at 11:43 am.

A handwritten signature in black ink, appearing to read 'J. Littleton', with a horizontal line extending to the right.

Jeff H. Littleton, Secretary

ATTACHMENTS:

- A. DEI Subcommittee Report
- B. Strategic Business Development Subcommittee Report
- C. Virtual Meeting Chat Log

REPORT TO THE BOARD OF DIRECTORS
From the BOD DEI Advisory Subcommittee
As of July 25, 2022

Recommendations for Board Approval:

1. **MOTION:** The BOD DEI Advisory Subcommittee recommends to the ASHRAE Board of Directors consider issuing a response to the request from Society of Women Engineers of coordinating efforts between ASHRAE and AIA on a Building Industry Statement to address the recent ruling overturning Roe vs. Wade.

BACKGROUND: An email was received by Beth Tomlinson representing Society of Women Engineers (SWE) asking for a response from ASHRAE's DEI Advisory Subcommittee in regard to coordinating efforts between ASHRAE and AIA on a Building Industry Statement to address the recent ruling overturning Roe vs. Wade. SWE provided a statement and due to membership outcries, revised their response: <https://swe.org/swes-statement-on-u-s-supreme-court-ruling-on-dobbs-v-jackson-womens-health-which-overturns-the-1973-roe-v-wade-decision/>

The consensus of the BOD DEI Advisory Subcommittee is that this issue is important and at minimum warrants discussion at the Board level. The BOD DEI Advisory Subcommittee acknowledges that this is a nuanced topic for ASHRAE to address without the appearance of ASHRAE involving itself in political matters.

VOTE: 5-1-0, CNV

Secretary's note: *Kishor Khankari voted negatively because he does not believe this is a DEI issue.*

FISCAL IMPACT: None.

Section 1: Committee Progress:

1. The BOD DEI Advisory Subcommittee consists of the following members Adrienne Thomle, Chair, Kishor Khankari, Vice Chair, Billy Austin, Devin Abellon, Susanna Hanson, Dennis Knight, Ashish Rakheja, Wei Sun and Tanisha Meyers-Lisle (Staff).
 2. For SY 2022-2023, the BOD DEI Advisory Subcommittee has refined our Purpose and listed updated MBOs as shown in [Attachment A](#). In an effort to organize our efforts, we have developed several working groups and assigned liaisons accordingly.
 3. The BOD DEI Advisory Subcommittee is in progress of developing the next DEI Forum/Panel Session.
 4. The BOD DEI Advisory Subcommittee is working to secure several quotes with our outside DEI Consultant, Mindy Gulati of Fundamental Advisory. We would like for her to provide additional trainings around unconscious bias, microaggressions, age and professional bias for Directors and Staff.
 5. The BOD DEI Advisory Subcommittee is developing a Book Club. Kishor Khankari is working with Sheila Hayter to create a formal book club which will be open to everyone to join. We will discuss our recent reading of Blind Spot: Hidden Biases of Good People by Mahzarin R. Banaji and Anthony G. Greenwald.
-
-

Date

Chair

ATTACHMENT A

The purpose of the Board DEI Advisory Subcommittee is to advise the Board of Directors on the following:	
All matters relating to diversity, equality, and inclusion - with a view to improving organizational awareness and performance in these areas amongst both staff and the Society membership.	Continue with BOD and leadership training Coordinate with MP for membership awareness training
Establish annual budgets for DEI program and ongoing initiatives.	
The prioritization of inclusivity issues which have relevance to ASHRAE, together with plans for addressing these issues.	
The ongoing work of the subcommittee will consist of the below:	
Recommend to the BOD actions to increase and improve inclusion within ASHRAE and the HVAC&R Industry and help the Society meets its commitments to fairness and equal opportunities. Recommendations would be expected to apply to	
Appointments	Nominating Committee liaison Make Nominating committee members aware of DEI and unconscious bias during nominating process
Honors and Awards	
Technical Group Membership	Tech Council and Membership Council liaisons
Volunteer Engagement	Membership promotion liaison
Chapter programs and initiatives	Membership promotion liaison
Monitor inclusion within the Society and assist the BOD by advising on policies and initiatives to improve inclusion amongst the membership.	Membership promotion liaison
Keep under review the Society's policy and practices relating to equity and diversity.	Annual review of ROB and BOD MOP
Set and publish goals based on our gaps and missing indicators	
Advise the BOD on the nature of the data to be collected from current members and applicants that may improve inclusion.	
Facilitate communications between ASHRAE and other relevant organizations, and to work in collaboration with them, to promote and embed inclusion and diversity in the engineering, construction, and related sectors.	Meet with CIBSE twice a year to share best practices Support board member and alternate for INWIC

Recommend Chapter and Society programs on DEI (webcasts, training and education program, Insight Articles, forums, conferences, and webinars)	Coordinate with Membership Council and Membership Promotion for Regional and Chapter Webcasts Create 2 articles a year for DEI in Journal or other publications Request seminar or forum/panel at each annual and winter meeting
Publish and regularly showcase the work of inspirational HVAC&R engineers from under-represented groups.	
Develop/source society training programs to members on DEI including, but not limited to;	
sexual harassment	
high performance team building	
recognizing and avoiding unconscious bias	Include unconscious bias training BOD and leadership training Coordinate with MP for regional and chapter unconscious bias training programs
The BOD DEI Advisory Subcommittee will report to the BOD twice a year regarding the above initiatives.	

Item #	MBO	Status	Due Date	Assigned	MBO Comments
1. Outreach to stakeholders					
1.1	Determine gaps/needs/obstacles for DEI through engagement with significant ASHRAE committees and leadership	New	12/30/2022	Adrienne Thomle, DEI Chair, Kishor Khankari & Megan Tosh	Incorporate DEI initiatives into ASHRAE to produce, distribute and monitor DEI activities (Presidential Initiative)
		New	6/30/2023	Adrienne Thomle DEI Chair, Kishor Khankari & Megan Tosh	Recognize that there are financial barriers for the best and the brightest to participate. We need innovative ways to address this barrier. (Presidential Initiative)
1.2	Continue with BOD and leadership DEI and Unconscious bias training	On-going	6/30/2023	DEI sub-committee	Incorporate DEI initiatives into ASHRAE to produce, distribute and monitor DEI activities (Presidential Initiative)
1.3	Recommend Chapter and Society programs on DEI (webcasts, training and education program, Insight	New	6/30/2023	Publication work group	Coordinate with Members Council and Membership Promotion for Regional and Chapter Webcasts

	Articles, forums, conferences, and webinars)	New	6/30/2023	Publication work group	Create 2 articles a year for DEI in Journal or other publications
		New	6/30/2023	Publication work group	Request seminar or forum/panel at each annual and winter meeting
		New	6/30/2023	Committee Liaisons	Develop training programs, webinars, podcasts, and presentations to improve DEI across Society. (Presidential Initiative)
		New	6/30/2023	Membership Promotion liaison	Coordinate with MP for regional and chapter unconscious bias training programs
2. Internal Activity Coordination and Support					
2.1	Recommend to the BOD actions to increase and improve inclusion within ASHRAE and the HVAC&R Industry and help the Society meets its commitments to fairness and equal opportunities.	New	10/15/2022	Nominating committee liaison	Make Nominating committee members aware of DEI and unconscious bias during nominating process
		On-going	6/30/2023	Committee chair/Vice chair	Meet with CIBSE twice a year to share best practices Support board member and alternate for INWIC
2.2	Review BOD MOP and ROB for DEI	On-going	6/30/2023	Committee chair/Vice chair	Include sexual harassment and unconscious bias training in ROB for all councils and committees (state of NY videos)
3. DEI Administration					
3.1	Establish liaisons with ASHRAE committees	New	9/30/2022	Committee chair/Vice chair	Create liaisons with the following Councils/Committees: Members Council, Student Activities and Membership Promotion; Tech Council; Pub Ed; and Nominating
3.2	Establish publication/communications work group	New	7/31/2022	Committee chair/Vice chair	



ATTACHMENT B

BOD OPEN SESSION MINUTES 2022 AUGUST 15

ASHRAE Strategic Business Development Subcommittee

Committee Members



Dru Crawley

Blake Ellis

Ken Fulk

Ron Gagnon

Chris Gray

Luke Leung

Jeff Littleton

Dunstan
Macauley

Randy
Schrecengost

Goals

Develop an actionable strategic business plan for rolling out new products and services. Existing products and services need to be re-evaluated, modified and/or discontinued to generate additional revenue for ASHRAE at an appropriate gross margin. It should be noted that ASHRAE has products and services which are a member benefit, those products and services must be evaluated based on the value of the member benefit versus the investment

Work Plan

Understand Where the Market is Today

- Review our current products and services to determine the profitability of our current products and services.
- SWOT Analysis of our products
- Review the current business models, operating practices and marketing strategies to determine how revenues/gross margins can be enhanced.
- Identify top 5 products in each category.
- Identify bottom 5 products in each category.

Work Plan

Understand Where the Market is Today

- Consult with ASHRAE chapters and industry partners to determine products and services desired based on global geographical regions
- Determine the needs of the industry in key geographical regions and determine if ASHRAE is positioned to fill the void?
- Determine opportunities to collaborate with industry partners to promote key topic areas globally?
- Identify opportunities to enhance brand recognition.
- Determine the products and services that our members desire. Also determine the needs of non-members (or potential new members). Do we know what our members want for content? More importantly, do we know what our non-members (and possible future members) want for content?
- Scan the market to establish the demand for potential new products and services which ASHRAE is qualified and should provide.

Work Plan

Select Our Key Areas of Focus

- We need to be looking for gaps in the built environment that ASHRAE is best positioned to fill.
- Identify the value adds of ASHRAE and how we can differentiate from others organizations
- How do we maximize the effectiveness of our virtual platforms?

Develop Possible Products & Services

- Identify potential new revenue streams or opportunities to bolster existing ones.
- Develop a business plan for new products.
- Identify opportunities to collaborate with industry partners.

Present Recommendations

- Get market feedback on potential products and services.
- Adjust based on feedback and make recommendations for additional sustainable product development pipeline.

Implementation

- Develop products and services.
- Get market feedback on the products and services and adjust as necessary.



Thank
You!



STRATEGIC BUSINESS DEVELOPMENT SUBCOMMITTEE OF THE ASHRAE BOARD OF DIRECTORS

Goals

Develop an actionable strategic business plan for rolling out new products and services. Existing products and services need to be re-evaluated, modified and/or discontinued to generate additional revenue for ASHRAE at an appropriate gross margin. It should be noted that ASHRAE has products and services which are a member benefit, those products and services must be evaluated based on the value of the member benefit versus the investment.

Develop a strategic evaluation of the market trends and identifying business development goals over the next five years.

Work Plan

1. **Understand Where ASHRAE is Today:** Review our current products and services to determine the profitability of our current products and services.
 - a. SWOT Analysis of our products
 - b. Review the current business models, operating practices and marketing strategies to determine how revenues/gross margins can be enhanced.
 - c. Identify top 5 products in each category.
 - d. Identify bottom 5 products in each category.
2. **Understand Where the Market is Today (Market Research)**
 - a. Consult with ASHRAE chapters and industry partners to determine products and services desired based on global geographical regions
 - b. Determine the needs of the industry in key geographical regions and determine if ASHRAE is positioned to fill the void?
 - c. Determine opportunities to collaborate with industry partners to promote key topic areas globally?
 - d. Identify opportunities to enhance brand recognition.
 - e. Determine the products and services that our members desire. Also determine the needs of non-members (or potential new members). Do we know what our members want for content? More importantly, do we know what our non-members (and possible future members) want for content?
 - f. Scan the market to establish the demand for potential new products and services which ASHRAE is qualified and should provide.
3. **Select Our Key Areas of Focus**
 - a. We need to be looking for gaps in the built environment that ASHRAE is best positioned to fill.
 - b. How do we maximize the effectiveness of our virtual platforms?
4. **Develop Possible Products & Services**
 - a. Identify potential new revenue streams or opportunities to bolster existing ones.
 - b. Develop a business plan for new products.
 - c. Identify opportunities to collaborate with industry partners.
5. **Present Recommendations**
 - a. Get market feedback on potential products and services.
 - b. Adjust based on feedback and make recommendations for additional sustainable product development pipeline.

6. Implementation

- a. Develop products and services.
- b. Get market feedback on the products and services and adjust as necessary.

ATTACHMENT C

- August 15, 2022 7:59 AM from Ginger Scoggins to everyone: I'm in Tokyo using hotel internet...so some of the talking is breaking up...will do my best to understand!
- August 15, 2022 8:01 AM from John Constantinide to everyone: I am encountering bandwidth issues, as well.
- August 15, 2022 8:01 AM from John Constantinide to everyone: I am here.
- August 15, 2022 8:02 AM from Ginger Scoggins to everyone: Thanks Dunstan!
- August 15, 2022 8:07 AM from Dr. Rashid Alshatti to everyone: I'm here. Microphine issues
- August 15, 2022 8:09 AM from Hossam to everyone: I am here too. Thanks.
- August 15, 2022 8:10 AM from 2345 350 7350 to everyone: Ibad Hasan - ASHRAE Pakistan Chapter
- August 15, 2022 8:16 AM from Safdar Ali to everyone: hi everyone.
- August 15, 2022 8:36 AM from Yash AK to everyone: ASHRAE Branding.This mission should be percolated down to the Chapter level and assign PAOE points for working on this. Guidelines need to be provided to Chapters and should be the President's KRA to take this forward at local level.
- August 15, 2022 8:38 AM from Yash AK to everyone: Can we have media contact at local news papers and releases - include local technical journals and journals of other associate technical bodies.
- August 15, 2022 8:43 AM from sayani to everyone: Should I understand that in a way Ashrae is going to act as a regulatory /Governing body or Recommendation authority for HVAC products/ equipment's in future
- August 15, 2022 8:45 AM from MRBAIG to everyone: Since ASHRAE is an international org, Sociery Govt Affairs committe to approach various Govt maybe directly or through some intl org
- August 15, 2022 8:46 AM from MRBAIG (privately):Since ASHRAE is an international org, Sociery Govt Affairs committe to approach various Govt maybe directly or through some intl org
- August 15, 2022 8:47 AM from MRBAIG (privately):To brand ASHRAE
- August 15, 2022 8:47 AM from Kay Thrasher to everyone: I agree that the Chapters can certainly help with branding, however, we need to make sure that the tools for outreach are given to them to do the job,.
- August 15, 2022 8:48 AM from 2345 350 7350 to everyone: Ashrae commercialism policy restricts to promote ashrae on grass root level or making it brand for household level. It should be more lenient in promotions and society level programs
- August 15, 2022 8:49 AM from Mirza Ajmal Sharif to everyone:I feel the technology is keeps on changing every and to handle the products we must share the new procedures to down the line and should have some kind d of counter check, by doing this way many accidents and produces damage cand be avoided,
- August 15, 2022 8:50 AM from Wei Sun to everyone: I like the idea to link the ASHRAE Branding/Reconigion with chapters' PAOE points to have a wide spread efforts
- August 15, 2022 8:50 AM from Mirza Ajmal Sharif to everyone:this could be through the technical trainings.

August 15, 2022 8:53 AM from Muhammad Farooq Saeed to everyone: If it permit the ASHRAE chapter student can be used for ASHRAE branding & marketing ideas to have some brilliant ideas from fresh minds

August 15, 2022 8:56 AM from John Constantinide to everyone: Farooq and all, I am having bandwidth issues. However, I concur with Adrienne's comment and speak against the motion on the same grounds.

August 15, 2022 8:56 AM from Jennifer Leach to everyone: This is a women's rights issue. Not social.

August 15, 2022 8:56 AM from Jennifer Leach to everyone: I don't speak for or against. Just that words are important.

August 15, 2022 8:57 AM from Kay Thrasher to everyone: ASHRAE should absolutely not be involved in this!

August 15, 2022 8:57 AM from Yash AK to everyone: No. ASHRAE is a technical society and should be limited to this scope. Should not get involved in any political or religious issues globally.

August 15, 2022 9:00 AM from Mahroo Eftekhari Region XIV to everyone: No ASHRAE should not be involved.

August 15, 2022 9:10 AM from Susanna Hanson to everyone: Why wouldn't our response to SWE be what we have been discussing here - the response is to SWE, in the motion, not to the decision.

August 15, 2022 9:12 AM from sayani to everyone: Jeff

August 15, 2022 9:26 AM from Anoop Peediayakkan - Kuwait (privately): Hi Chandrias...Hope you are fine.

August 15, 2022 9:26 AM from Anoop Peediayakkan - Kuwait (privately): I'm getting connection issues..

August 15, 2022 9:27 AM from Anoop Peediayakkan - Kuwait (privately): you will mute me right.when I'm logging in.

August 15, 2022 9:28 AM from Atam Hayat to everyone: Thanks Mr. President & everyone else

August 15, 2022 9:31 AM from Jennifer Leach to everyone: Black tie optional.

August 15, 2022 9:31 AM from Adrienne T (privately): Hi Chandrias would you please forward the document you showed for the report I need to write?

August 15, 2022 9:31 AM from Adrienne T (privately): Thanks Adrienne

August 15, 2022 9:33 AM from Sarah Maston (privately): Can I share during my subcom report shortly, or can you bring up the streamlingin subcom charge?

August 15, 2022 9:45 AM from Eileen Jensen, Reg. XI DRC to everyone: Region XI CRC sent a motion to Society to utilize member volunteers to translate standards into other languages.

August 15, 2022 9:52 AM from Yash AK to everyone: When the standards are used for certifications, manufacturers will be a huge pool of customers. aka AMCA etc.

August 15, 2022 9:58 AM from Yash AK to everyone: Develop certifications/licensing programs for HVAC contractors. In countries like India there are no HVAC liecnسد contractors. This can improve qualityof

HVAC construction. For example, Buildings designed and constructed by ASHRAE certified contractors can get additional points. This can lead to members or non-members aspiring to be ASHRAE certified INSPECTORS/QUALITY AUDITORS etc. Most importantly this should be done at local body level through Local/Regional Chapters. Guidelines should be developed by ASHRAE but parameters and licensing fees/tests should be based on local/regional criterion.

August 15, 2022 10:00 AM from Yash AK to everyone: Integrate LEED/USGBC etc certification with ASHRAE contractor licensing, ASHRAE certified Auditors and Quality Inspectors

August 15, 2022 10:47 AM from Yash AK (privately):Hi. Can you share the email address where I can send my comments.

August 15, 2022 10:51 AM to Yash AK (privately): Hi. Comments can be sent to cdevaughn@ashrae.org. Please be sure to provide your name and the date of todays meeting.

August 15, 2022 10:53 AM from Yash AK (privately):Thanks. Yes. Shall mention the details as mentioned by you.

August 15, 2022 10:55 AM from Rick Hermans to everyone: If ExCom went away, decisions between BOD mtgs would have to be made by staff.

August 15, 2022 11:04 AM from Eileen Jensen, Reg. XI DRC to everyone: Wouldn't the same hold true for the Regional Chair filling in for the District Director?

August 15, 2022 11:05 AM from Ken Fulk (privately): I was temporarily disconnected just so you know.



MINUTES

BOARD OF DIRECTORS MEETING

ISTANBUL, TURKEY
October 13-14, 2022

Note: These draft minutes have not been approved and are not the official record until approved by the Board of Directors.

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PRINCIPAL APPROVED MOTIONS

Board of Directors Meeting

October 13-14, 2022

No. - Pg.	Motion
1 – 3	The minutes from the August 15, 2022 BOD meeting be approved.
5 – 8	ExCom recommends that the BOD approve the MOU with the UAE Ministry of Energy (ATTACHMENT A).
6 – 8	ExCom recommends that the BOD approve the new Toronto Chapter scholarship (ATTACHMENT B).
8 - 13	The BOD reaffirm the goals stated in the 2020 Vision Statement and the 2007 BOD vote as well as the decarbonization position document to achieve net zero energy buildings by 2030.
9 - 17	<p>The following motions be considered as a consent motion:</p> <ul style="list-style-type: none"> ➤ Standards Committee recommends that BSR/ASHRAE Addendum <i>x</i> (<i>relocates exhaust requirements</i>) to ANSI/ASHRAE Standard 62.1-2022 <i>Ventilation and Acceptable Indoor Air Quality</i>, be approved for publication. ➤ Standards Committee recommends that BSR/ASHRAE Addendum <i>i</i> (<i>establishes minimum requirements for ozone emissions of air-cleaning systems</i>) to ANSI/ASHRAE Standard 62.2-2022, <i>Ventilation and Acceptable Indoor Air Quality in Residential Buildings</i>, be approved for publication. ➤ Standards Committee recommends that BSR/ASHRAE Addendum <i>J</i> (<i>prohibits the installation of unvented combustion space heaters within dwelling units</i>) to ANSI/ASHRAE Standard 62.2-2022, <i>Ventilation and Acceptable Indoor Air Quality in Residential Buildings</i>, be approved for publication. ➤ Standards Committee recommends that BSR/ASHRAE Addendum <i>m</i> (<i>minimum efficiency of certain filters</i>) to ANSI/ASHRAE Standard 62.2-2022, <i>Ventilation and Acceptable Indoor Air Quality in Residential Buildings</i>, be approved for publication. ➤ Standards Committee recommends that BSR/ANSI/ASHRAE Addendum <i>h</i> (<i>ELC revisions</i>) to ANSI/ASHRAE Standard 90.4-2019, <i>Energy Standard for Data Centers</i>, be approved for publication. ➤ Standards Committee recommends that BSR/ANSI/ASHRAE/ICC/USGBC/IES Addendum <i>k</i> (<i>Emergency Ventilation Rates</i>) to ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2020, <i>Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings</i>, be approved for publication.

	<ul style="list-style-type: none"> ➤ Standards Committee recommends that BSR/ANSI/ASHRAE/ICC/USGBC/IES Addendum <i>m (Emissions and SECFs Update)</i> to ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2020, <i>Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings</i>, be approved for publication. ➤ Standards Committee recommends that BSR/ANSI/ASHRAE/ICC/USGBC/IES Addendum <i>y (Prohibition of Smoking and Vaping)</i> to ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2020, <i>Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings</i>, be approved for publication.
10 - 18	Standards Committee recommends that BSR/ASHRAE Standard 230P, <i>Commissioning Process for Existing Buildings and Systems</i> , be approved for publication.
11 - 18	<p>The following motions be considered as a consent motion:</p> <ul style="list-style-type: none"> ➤ Technology Council recommends that proposed changes to the Procedures for ASHRAE Standards Actions (PASA) within Section 4. Approval Of Proposed Standards, Section 5. Relationships with other Standards-Developing Organizations, Section 7. Criteria for Approval, Withdrawal, and Discontinuance of ASHRAE Standards and Guidelines, Annex A1: Definitions, Annex B: Appeals of Board of Directors' Standards Actions or Inactions, and Annex C: Complaints of Actions or Inactions by the StdC, its Subcommittees or PCs, be approved as shown in ATTACHMENT D. ➤ Tech Council recommends that proposed changes to the Rules of the Board Section 2.425.001 <i>Scope and Purpose</i>, and Section 2.425.003 <i>Operation</i>, be approved as shown in ATTACHMENT E.
12 - 19	Technology Council recommends that the Board of Directors approve the revised <i>Infectious Aerosols</i> position document (PD) as shown in Attachment F.

ACTION ITEMS

Board of Directors Meeting

October 13-14, 2022

No. - Pg.	Responsibility	Summary of Action	Status	Goal Date
1 – 9	Macauley	Investigate the possibility of developing regions specific ALI courses. Region specific courses would be developed by members outside of North America and presented by members from the regions where they were developed.		
2 – 11	Knight	Work with the Finance Committee to reevaluate the 65% of Full Member dues that is used to set the Developing Economy dues rate.		
3 – 13	Littleton	Take the documentation from the Global HVAC Summit and forward it to the TFBD ExCom. The TFBD will address relevant items from the summit in a future report.		



MINUTES
BOARD OF DIRECTORS MEETING

October 13-14, 2022

MEMBERS PRESENT:

Farooq Mehboob, President
Ginger Scoggins, President-Elect
Dennis Knight, Treasurer
Billy Austin, Vice President
Dunstan Macauley, Vice President
Sarah Maston, Vice President
Ashish Rakheja, Vice President
Jeff Littleton, Secretary
Steven Sill, Region I DRC
Ronald Gagnon, Region II DRC
Mark Tome, Region III DRC
Bryan Holcomb, Region IV DRC
Jim Arnold, Region V DRC
Susanna Hanson, Region VI DRC
Chris Gray, Region VII DRC

Tyler Glesne, Region IX DRC
Devin Abellon, Region X DRC
Eileen Jensen, Region XI DRC*
John Constantinide, Region XII DRC*
Cheng Wee Leong, Region XIII DRC
Andres Sepulveda, Region XIV DRC
Richie Mittal, RAL DRC
Blake Ellis, DAL
Luke Leung, DAL
Wei Sun, DAL*
Dru Crawley, DAL
Ken Fulk, DAL
Art Giesler, DAL
Wade Conlan, DAL
Kishor Khankari, DAL
Adrienne Thomle, DAL*

STAFF PRESENT:

Candace DeVaughn, Manager - Board Services*
Chandrias Jolly, Assistant Manager - Board Services*
Joyce Abrams, Director - Member Services
Vanita Gupta, Director - Marketing
Kim Mitchell, Chief Development Officer
Mark Owen, Director - Publications & Education*
Stephanie Reiniche, Director - Technology
Alice Yates, Director - Government Affairs
Craig Wright, Director of Finance
Tanisha Meyers-Lisle, Procedures Administrator*
Ayah Said, Manager – Global Training Center, Dubai*
Joslyn Ratcliff, Sr. Manager – Marketing Communications*

*Virtual Attendee

GUESTS PRESENT:

A.K.M. Foyсал Ahmed*	Dinesh Madhuranga*	Mahesh Prabhu	Rajkumar Balasubramanian*
Abbas Sajid	Don Denton*	Mahmood Ahmooq	Rashid Alshatti *
Abdul Rehman*	Doug Cochrane*	Mahroo Eftekhari*	Ravindu Viduranga*
Abdullah Yousef*	Eduardo Maldonado*	Maitham Abdulla	Richard Rooley
Ade Anujoola	Emeka Achebe	Mallikarjun Andanappa*	Roy Crawford*
Ade Oyenekan	Enea Dimtris Tseno*	Marko Ignjatovic*	Rupesh Umtol
Ahmed Alaa Eldin	Erol Arcakioglu	MD Hasmotuzzaman	Ruwan Kurera*
Ahmet Goksin	Faisal Abdallat	MD. Ershed Jaman Khan	Salah Ebrhim Hassan
Akash Saxena	Francis Mills*	MD. Mahafizur Rahman	Salah Salem*
Al-Emran Hossain*	Gabriel Okwuofu*	Megan McNulty*	Sam Hui*
Alexandre Kontoyanis*	Gary O'Sullivan*	Menuwan Jayasuriya*	Sana Alazzez*
Ammar Bahman*	Gemunu Senadheera*	Mick Schwedler	Sandesh P. Bhure
Amol S. Joglekar	Gerardo Alfonso*	Mohamed Abdelrahim*	Sayani Havi Babu
Amr Adel Galal	Ghassan Al Ali	Mohamed Abdelwarith Said*	Scott Peach*
Ananta Ahmed	Guillermo Soriano*	Mohammad Monzur Alam*	Serafin Grana*
Anoop Peediyakkan*	Gurpreet Maini*	Mohammad Tassi	Shamila Karunanayake*
Ardiyansyah Yatim*	Hani Timsah*	Mohammed Asif Basha	Shuja Khalid
Ashley Keller*	Harrison Kesling*	Mohammed Murtaza	Suei Keong Chea*
Ashok Virmani	Harshal Surange	Mohammed Shamroukh	Syed Mubarak Abdul Razaak*
Ather Naseem Siddiqui	Hasmukh Patel	Moiz Ashraf*	Tarik Bilto
Atilla Biyikoghu	Ibad Hasau	Muhammad Farooq Saeed*	Thomas Phoenix*
Babatunde Badru*	Ibrahim Shabaka*	Muhammad Harold	Tim Wentz
Bassel Anbari	Irene Reichert*	Muhammad Mohsin	Tulia Rios*
Bharat Jare*	Isagani Brugada*	Muhammed Omer Khan	Tyler Owens*
Bill Bahnfleth*	Jalal Ifsaisi*	Nilan Ranasundara*	Udaa Perera*
Bill Damon*	Jaspal Singh*	Nilesh Patel	Umut Yilmaz*
Bill Walter*	Jeffrey Eng Ee Seong*	Niss Feiner*	Van Baxter*
Bratislav Blagojevic*	Jennifer Isenbeck*	Nitin Naik	Vijaya Baskarans
Buzz Wright*	Jintana Sirisantana*	Nivedita Jadhav	Vineet Nair*
Carl Huber*	Jonathan Smith*	Nivedita Jadhav*	Vinod Venugopal
Carlos Gabriel Farto*	Joshua Vasudevan*	Ola Kamiyo*	Vishal Kapur
Cesar Luis Lim*	Julia Timberman*	Olubukunmi Olatunbosun*	Vivedita Jadhan
Ching Loon Ong*	Junjing Yang*	Om Taneja*	Vorasen Leewattanakit*
Chirdpun Vitooraporn*	Kafi Uddin*	Osama Khayata	Wael Eid*
Costas Balaras*	Kanauaraj Ganesan	Pankaj Saweew	William Fisher*
Courtney Araiza*	Kavita Dhanawade*	Pankajbhai Amin*	Wimala Goonaratne
Danny Castellan*	Kay Thrasher*	Peter Lavery*	Yashkumar Shukla
David Lau*	KC Ng*	Poorna Gamage*	Yeshwant Karkhanis
David Roberts*	Kent Peterson*	Pranar Godbole	Yongkie Tileno*
David Underood*	Krishna Kumar Mitra	Praveen Kumar Jha*	Yuichi Takemasa*
David Underwood	Krishna Kumarmitra	Priyank Garg	Zack Rose*
Dayani Gunawardhana	Krishnan Viswanath	R. Salman	Zaki Zaatari
Deddy el Rashid*	Lukasz Semla*	Rahi Al Asad	
Dimpy Daroch*	Maggie Moninski*		

*Virtual Attendee

CALL TO ORDER

Mr. Mehboob called the meeting to order on October 13, 2022 at 3:09 pm.

CODE OF ETHICS

Mr. Mehboob read the code of ethics commitment and advised that the full code of ethics and core values are available online.

ROLL CALL/INTRODUCTIONS

Roll call was conducted; members, guests, and staff in attendance as noted above.

REVIEW OF MEETING AGENDA

Mr. Mehboob reviewed the meeting agenda. There were no changes or additions.

APPROVAL OF MINUTES**AUGUST 15, 2022**

Mr. Gagnon moved and Ms. Scoggins seconded that

1. The minutes from the August 15, 2022 BOD meeting be approved.

MOTION 1 PASSED (Unanimous Voice Vote, CNV).

REVIEW OF ACTION ITEMS**JUNE 29, 2022**

Both action items were reported as complete.

AUGUST 15, 2022

The action item was reported as complete.

POSTPONED MOTIONS

Ms. Scoggins stated that due to the interest in these votes and in order to dissuade any concerns about peer pressure, it has been decided that both postponed motions will be voted on via letter ballot.

Mr. Mehboob added that letter ballots will avoid public pressure and allow Directors to vote with their consciences. BOD members participating in the meeting virtually will share their vote privately in the chat with staff.

Hearing no opposition, Mr. Mehboob stated that the BOD will move forward with using letter ballots.

WEDNESDAY, JUNE 29, 2022

2. Motion 14 from the June 29, 2022 BOD meeting be considered

The Society implement the recommended revisions to the ASHRAE Board of Directors and councils' structure as listed in APPENDIX I of the Board Composition and Leadership Structure Subcommittee Final report dated June 26, 2022 (ATTACHMENT F).

Mr. Mehboob opened the floor for discussion. A summary of the discussion is below:

Gagnon – Spoke strongly against the motion. Choosing between two options is biased.

Gray – Spoke in favor of the motion. Society must be willing to embrace change to ensure we thrive and not just survive.

Jensen – Spoke against the motion. Have yet to be given an explanation as to how reducing the number of BOD members will make the BOD more strategic and nimbler. Can only conclude that the goal is to reduce the number of voices on the BOD.

Reducing the number of BOD members would be a loss to the rich diversity of opinions and limit the inclusion of those who would otherwise not be represented. Fewer representatives on the BOD does not provide enhanced globalization; creates the appearance of placing power in the hands of a few and makes Society look elitist and opaque.

Suggest waiting to see if the recently approved changes provide any of the desired changes. If too many things are changed at once, there is no way of knowing what worked.

Constantinide – Cautiously in favor of the motion. Agree with numerous points that Ms. Jensen made. What is encountered at the BOD level is more than a composition issue, it is an operational issue. If the goal is to empower the councils more, that should be done and then streamlining reassessed.

Would like to hear more discussion and then suggest that the motion be tabled or postponed.

Rakheja – Undecided on the motion. Received feedback from the CRCs that there is a sense of insecurity and concern over the additional layer that districts would create.

How will the silos of the councils be addressed? It was not properly communicated and did not appear in the presentation that work is already being done to break down silos and empower the councils.

Khankari – Spoke against the motion because the grassroots members are not in favor. Primary objection is that the BOD is currently strategic; the number of members on the BOD and whether the BOD is strategic do not go together. Currently having 30 members on the BOD is an asset, members should be assigned strategic items and held accountable.

Several hundred hours of volunteer time have gone into the current structure, please think before a new one is selected.

Ellis – In favor of the motion. How do you have a discussion with 30 of your closest friends? The answer is you don't. This motion will solve all inefficiencies and will help us get better. It also

simplifies and improves BOD communication. Currently, there isn't time to have discussions. How do we address the issues of the day without the ability to have discussions.

Don't see the motion having an impact on chapter operations. Would strengthen the nomination process. This vote isn't to implement the change but to ask our members if the change should be implemented.

Abellon – In favor of the motion. I came through the grassroots and feel that the proposed structure will not only result in a more agile and strategic BOD but will also better serve grassroots members on issues that most impact them.

A lot of vocal concerns and I understand. The motion does not combine or merge regions – Directors will serve multiple regions and DRCs will still be able to work closely with the regions. There is a sense that grassroots members have a voice because their DRC sits on the BOD. There were 20 motions presented today that will go to Members Council; the goal is to empower Members Council to make the decisions that matter most to the members.

Leong – Do not need to reduce BOD size to be more efficient; can be done in other ways. Not in favor of the reduction of the BOD.

Fulk – After a lot of careful thought, I have decided that I am against the motion. Express sincere thanks for those involved in developing this proposal. Agree with a lot of the comments already made.

Several concerns still remain. A smaller BOD does not guarantee anything. I know of large and effective BODs. Many factors determine how effective a BOD is. Currently pursuing streamlining at all levels of ASHRAE, suggest waiting to see the results of these efforts before deciding if the size of the BOD is a problem. Do we allow the BOD to be larger in the future? What impact does the proposed BOD size reduction have on grassroots efforts? No other professional organization has the DRC structure that Society has and that makes us special and more effective at feeding our grassroots.

A smaller BOD results in less BOD level exposure and will make it non-existent over time. Direct connection from the BOD to chapters is needed. Unintended consequences will be detrimental to Society and membership growth.

Suggest that structural and operational changes be considered to council leadership and ExCom makeup.

Mittal – Spoke against the motion. Agree with many of the points already made.

Austin – Spoke against the motion. Spoke against tabling the motion. The motion does add a layer of management. Haven't seen an effort by the BOD to be strategic in our meetings. Being strategic has been delegated to the Planning Committee.

Glesne – What was the opinion at Members Council?

Scoggins – Had a discussion today; some were for the recommendation but the majority were not in favor.

Holcomb – If it were as easy as changing agendas, would question why this hasn't been done in the past. The BOD must recognize the members while continuing to change and adapt to what is going on in Society. Feel this motion is a monumental step towards moving forward.

Sill – Region I is currently the largest region in Society. Conducted a town hall at the CRC and the membership was in favor of the motion two to one. Spoke in favor of the motion.

Macauley – Spoke in favor of the motion. This was not a streamlining exercise. The task of this subcommittee was to look at the current structure of the BOD and make recommendations on that alone.

Our structure was created in 1959 when ASHRAE was only a US based organization with less than 20,000 members. Society has grown considerably and our structure hasn't changed to adapt to the changing needs of our members and position us to grow as we face stiff competition.

Numbers and diversity don't go hand in hand, that is quotas. Suggest focusing on what is needed to move forward and to be more effective to meet the needs of our members.

Gray – If a Director is only here to represent her/his region, would suggest that is an ethical violation. At the BOD level, Directors take off their DRC hat and think about the Society as a whole.

Should take recommendations that our BOD is too large into consideration.

Constantinide – Realized that thinking too long about a proposal doesn't always come to the best proposal.

Mr. Constantinide moved that

3. The motion on the floor be postponed until the February 2023 BOD meeting.

MOTION 3 FAILED TO SECOND.

Discussion of MOTION 2 resumed.

Khankari – This is not streamlining; this is restructuring with the goal to streamline. The Society's current structure was formulated over 70 years ago, should we not be following the same straight line? This recommendation is going in the other direction.

Conlan – Future growth of our Society would allow for nine regions to be added without changing the structure of the BOD.

The current vetting process for evaluating future BOD members is not an equal process for all Directors. The model presented would make this an equal process.

The model presented would also increase the vision of what it means to be on a council.

The recommendation changes more than just the number of BOD members. Would be nice to hear comments on other aspects of the presentation.

Crawley – Serve on another large BOD and it is hard to get things done and have quorum. In favor of this motion.

MOTION 2 FAILED (10:19:1, CV).

Mr. Mehboob thanked Mr. Macauley and his subcommittee for their work. He stated that he was sure that much of the group's work will carry into other streamlining activities moving forward.

Mr. Mehboob stated the BOD should have full and complete management and control of the Society. He read ASHRAE Bylaw 4.4:

The Board of Directors shall have full and complete management and control of the activities and funds of the Society and may adopt such rules and regulations for the conduct of its meetings, the exercise of its powers, and the management of the affairs of the Society as it may deem proper, subject to the provisions of the laws of the State of New York, the Certificate of Consolidation and these Bylaws.

MONDAY, AUGUST 15, 2022

4. That Motion 3 from the August 15, 2022 BOD meeting be considered

The BOD DEI Advisory Subcommittee recommends to the ASHRAE Board of Directors consider issuing a response to the request from Society of Women Engineers of coordinating efforts between ASHRAE and AIA on a Building Industry Statement to address the recent ruling overturning Roe vs. Wade.

Mr. Mehboob stated that at the August 15 BOD meeting, the question before the BOD was, 'Does our BOD want to get involved in social issues particularly pertaining to one part of the world, as we have social issues in the 130 countries we operate in.'

He stated that staff reminded the BOD that the Society's 501(c)3 status prohibits Society from being involved in political discussions.

Mr. Mehboob opened the floor to discussion. A summary of the discussion is below:

Thomle – Want to remind the BOD that this request came from the Region VI GAC RVC. Do not have a draft statement for the BOD to review at this time.

Mehboob – At this time, a draft response is not so important. Remind the BOD that silence is also a response.

Hanson – Want to clarify that this request did not come from SWE and the statement that organization issued was only used as an example. This request came from Beth Thomlinson.

Constantinide – Is the BOD responsible for making the response?

Mehboob – The BOD would first need to decide if we are going to go down this road.

Scoggins – Have strong personal opinions but don't feel it is Society's job to get involved. Therefore, speak against the motion.

Arnold – Spoke against the motion. The motion opens up the gates. Could address other injustices in the world as well.

Glesne – This is not just a social justice issue, it is a human rights issue. Can't find in our mission where we should speak to this issue. Spoke against the motion.

Sun – Discussed this at the last BOD meeting. Speak against the motion. There are many other social issues.

MOTION 4 FAILED (2:27:1, CV).

EXCOM REPORT TO THE BOD

AUGUST 31, 2022

Mr. Knight reported.

Mr. Knight moved that

5. ExCom recommends that the BOD approve the MOU with the UAE Ministry of Energy (ATTACHMENT A).

Mr. Knight reported that this MOU is the equivalent of an MOU with the Department of Energy in the US. The MOU doesn't fully commit Society to anything but is an important and strategic partnership for Society.

MOTION 5 PASSED (Unanimous Voice Vote, CNV).

Mr. Knight moved that

6. ExCom recommends that the BOD approve the new Toronto Chapter scholarship (ATTACHMENT B).

Mr. Knight reported that criteria for the proposed scholarship is noted in the "Purpose" section of the attached agreement between the ASHRAE Foundation and the ASHRAE Toronto Chapter dated and signed July 6, 2022.

Current list of schools in Toronto with an ASHRAE student branch:

- Ryerson University – ACTIVE
- Seneca College – ACTIVE
- Sheridan Institute of Technology – ACTIVE
- University of Toronto – ACTIVE
- Humber College – ACTIVE
- Centennial College – ACTIVE
- George Brown College – ACTIVE
- Lakehead University – ACTIVE

Current list of schools in Toronto with programs accredited by Engineers Canada (a signatory of the Washington Accord):

- Ryerson University

- University of Toronto
- York University

Mr. Conlan noted an editorial change that the wrong country for Society is listed incorrectly in the document.

MOTION 6 PASSED (Unanimous Voice Vote, CNV).

Mr. Knight reviewed information items.

Mr. Khankari suggested that ALI courses are mostly developed from North American instructors and a North American point of view. He suggested that it would be better that courses with similar topics be developed by regions outside of North America. He stated that these proposed courses would be relevant to those regions and the presenters would come from those regions, helping to reduce travel.

Mr. Macauley will investigate the possibility of developing region specific ALI courses. Region specific courses would be developed by members outside of North America and presented by members from the regions where they were developed.

AI - 1

TREASURER'S REPORT

FINANCIAL UPDATE FY21-22 RESULTS

Mr. Knight reported. He reviewed the presentation attached to the agenda.

FY22-23 YTD THROUGH AUGUST – DASHBOARDS AND FINANCIAL STATEMENTS

Mr. Knight reported that for the last two years, the Subcommittee on Financial Focus has been working toward getting a set of key performance indicators and provide the BOD with up-to-date information prior to meetings.

Mr. Knight reviewed the report attached to the agenda.

Mr. Knight reported that beginning in December, the BOD will begin receiving a financial dashboard.

It was stated that the BOD receives a lot of dashboards. It was suggested that all dashboards are sent to the BOD at once and condensed to one to two pages.

Mr. Littleton will work to combine all monthly dashboards sent to the BOD into one 'snapshot' document.

FINANCE COMMITTEE REPORT TO THE BOD

Mr. Knight moved that

7. Finance Committee recommends to the Board of Directors (BOD) a proposed dues increase in ASHRAE Society Year 2023-2024 using indices that more closely reflect annual operational cost increases. This adjustment is in accordance with the Finance Committee Reference Manual, Section 8 – Dues Increase Guideline.

Mr. Knight reported that attachment A of the Finance Committee report outlines the recommended Fiscal Year 2023-2024 dues.

Until a few years ago, the dues calculation was calculated using the Consumer Price Index (CPI) as the only basis for adjustments. It is currently used as a comparison to the revised dues formula for discussion and as a point of reference.

The revised dues formula includes the use of a combination of indices including the Producer Price Index, Employment Cost Index and actual staffing cost increases and rounds the calculated figures to the closest 5 or 0.

The BOD still has the prerogative to make individual adjustments in dues for any membership grade at any time as they may desire based on conditions that exist at the time of consideration.

There was extensive discussion of the motion. A summary of that discussion is below:

Gray – Cost per member is around \$85 or \$86 per member. How do those two correlate? How do we justify a dues increase if we are within cost to provide member services.

Knight – Feel there is an error on the dashboard. Finance will dig into how the cost per member is being calculated in the dashboard because that is not correct.

Mehboob – Would you like to defer this motion until you can bring forward the justification for consideration by the BOD?

Knight – Do not have a problem deferring the motion.

Mehboob – Would the BOD like more information on the justification?

Glesne – Recommended that an action item be assigned to Finance to see if something a little more equitable can be done for the membership.

Rakheja – These indexes are related to the US. There has been unprecedented currency reduction around the world. Some members would have to pay more than double the current dues rate. Suggested that a better mechanism be developed for future use.

Gray – Actual cost per member is an important topic and I am trying to understand. Have to be very careful to ensure we are setting dues appropriately across the board to ensure we are covering costs. This is an information item I would like to understand more.

Ellis – The Finance Committee Reference Manual provides guidelines for calculating rates to raise member dues. The committee considers the consumer price index as well as relative salary increases in the US (addressing staff costs). After considering these financial indicators, the Finance Committee makes a recommendation.

The current process does a pretty decent job of tracking where Society's costs are. In the past, Society dues were lagging pretty dramatically.

Mehboob – Does the Finance Committee consider that 1/3 of members do not live in the US and the definition of the World Bank doesn't even cover certain countries?

Sepulveda – The growth of member revenues is about the same because of the increase in Society dues. Member growth considered for the next two years is almost zero.

Fulk – Mr. Ellis did a good job summarizing. When the current process was developed ten years ago, the cost of member services in developing economies was considered. May need to be looked at again.

Khankari – Agree with formulas and what is going on from a commonsense point of view. Looking at this as a member, if we have a surplus budget why are dues increasing? Are we just using the formula?

Gray – Mr. Khankari raises a very good point. Keep in mind that our surplus and deficit is a very slim margin. Society is projected to have a surplus budget, but that could very easily change.

Knight – All we have to do is look at expenses and see that we are almost \$500 and some dollars per member, those are real costs, and that trend will accumulate.

Mehboob – There is a growing number of Life Members that do not pay dues. Would we consider asking them for a contribution rather than put the whole thing on our younger members?

Crawley – ASHRAE has the most inexpensive dues of any organization I have ever belonged to and I get five times the value out of my ASHRAE membership than I do from any of those other organizations.

Hanson – Renewals aren't considered when dues increase. When dues are increased, should it be communicated what Society has done to offset the costs? What is currently being done to manage the perception when dues are increased?

Knight – Society just went through the loss of an AHR Expo and we weathered it because we are managing our funds and managing our reserves. Society has to have a rainy day fund to remain a viable organization and that has to be taken into consideration.

Rakheja – At no point in time should the intent be to do away with the dues increase cycle. What we are discussing is trying to come out of the formula where we can address concerns arising from various parts of the world.

Mr. Knight and the Finance Committee will reevaluate the 65% of Full Member dues that is used to set the Developing Economy dues rate.

Mr. Littleton reported that Society currently has 3,545 members in the developing economies program. Out of that, 1,230 are Student Members, so there are currently 2,315 members in the developing economies program that would be impacted by the proposed motion.

MOTION 7 WITHDRAWN with no objection.

Mr. Knight reviewed the Finance Committee's information items.

Mr. Khankari suggested that the investment dashboard be included. Members need to see we are investing their money.

Mr. Wright reported that \$2 million was transferred to the Society's investment advisor several months ago and an additional \$600,000 will be invested in the market before the end of the calendar year. He reported that the financial advisors have purview to decide when to invest the additional funds.

Mr. Khankari reported that the Society's current investment strategy is to invest 70% in stocks and 30% in fixed income value like bonds. He reported that the Society's current investment strategy is a three on the risk scale of one to five.

Mr. Knight stated that everyone has their own risk tolerance but BOD members are a fiduciary for our members. He reported that the Society's investment guidelines and the BOD's risk tolerance is a fair amount more conservative than if it were our own money and Society's investment firm is behaving accordingly.

Mr. Leung stated that Ms. Scoggins' report on scope 3 emissions could be used to calculate what it would take to be the first organization in history to reach net zero.

Mr. Mehboob asked that Mr. Leung's suggestion be raised under 'New Business.'

TASK GROUP REPORTS

TASK FORCE FOR BUILDING DECARBONIZATION EXCOM

Mr. Peterson reported that the TFBD ExCom has been extremely busy and he commended the members for stepping up to meet the challenge set by the BOD.

He reviewed the presentation, included in ATTACHMENT C.

Mr. Peterson opened the floor to questions:

Very North American centric organizations for collaboration. Are we working to get that collaboration internationally?

Peterson – The collaborative is currently a North American collaborative. The Global Advisory Panel met for the first time last week. The TFBD ExCom is looking into funding from DOE to help push this out to municipalities and DOE is focused on North America. Other agencies will be included in future reports.

The first guide will be available in December and will be free because of DOE's funding. For future guides, funding and method of delivery are not determined. TFBD ExCom is currently receiving feedback and input from others on how the guides can be made available for free in the future.

Can you comment on whether a chair has been identified? Were SPLS liaisons included? Want to ensure that we can continue the good work of the TFBD.

Peterson – STD 211 does not currently have a committed chair, but they have a leader. One individual has indicated that they would be willing to be a chair in the future, but that individual is fairly committed. If our current plan works, would not have to reconstitute that project committee until after the standard is reaffirmed.

A virtual meeting was held and SPLS members were not in the room; it was more of an open discussion. Would highly encourage the SPLS to get involved.

With respect to work plans, feel that we will want more accountability embedded into what we expect. Can you comment on that?

Peterson – Work plans are guiding documents but it is always good to have a plan and discussion. If the plan is approved, at least you know that the consensus body has the goal to move in that direction. The project committee is not raising red flags at this time. Believe it is always good for us to have work plans.

Encourage everyone to read through the 90.1 work plan when that gets published to know what the overriding goals of the organization are.

Is there a need for the BOD to reaffirm the goals and previous BOD vote?

Peterson – Do feel it would have an impact to reaffirm the commitment that the BOD made 15 years ago. If the BOD could send a message down or if the message came from Standards Committee, it would mean a lot to those outside Society as well.

We as an organization should not sit on the sidelines and allow others to write a code. Society could publish a zero energy code and indicate that 90.1 is moving in this direction. Work could also be done to move jurisdictions in this direction if they are looking to be leaders in this area.

If Society wants to be the leader in the next nine years, we need to do this. People are looking for Society to lead in these areas.

Hope our efforts from the summit will be carried over. At the HVAC Summit, there was discussion of the 'R' in ASHRAE as well as 90.1 seemingly not addressing refrigeration or other energy loads that will have to be addressed as we approach net zero.

Mehboob – Would like to allow Mr. Peterson to review the results of the Global HVAC Summit before responding.

Mr. Littleton will take the documentation from the Global HVAC Summit and forward it to the TFBD ExCom. The TFBD will address relevant items from the summit in a future report.

AI - 3

Ms. Scoggins moved and Mr. Ellis seconded that

- 8.** The BOD reaffirm the goals stated in the 2020 Vision Statement and the 2007 BOD vote as well as the decarbonization position document to achieve net zero energy buildings by 2030.

The meeting recessed at 6:19 pm.

The meeting reconvened on Friday, October 14 at 9:24 am.

CODE OF ETHICS

Mr. Mehboob read the code of ethics commitment.

ROLL CALL/INTRODUCTIONS

Roll call was conducted; members, guests, and staff in attendance as noted above.

Mr. Mehboob opened the floor for discussion on the motion.

Mr. Leung stated that Architecture 2030 has a net zero code that was adopted by ICC. The point is, if we don't do it, other organizations will.

Mr. Fulk asked if Society had previously reaffirmed its commitment. What are we tracking as it relates to the goals set in 2007?

Mr. Mehboob stated that the commitment was previously reaffirmed and that the goals set in 2007 were achieved by Society.

Mr. Littleton reported that milestones are also available in Mr. Peterson's presentation, ATTACHMENT C.

MOTION 8 PASSED. (Unanimous Voice Vote, CNV).

Ms. Scoggins requested that this decision be communicated to Technology Council and Standards Committee as soon as possible.

Mr. Mehboob stated that he would certainly issue a letter. He agreed with Ms. Scoggins that we don't want Society left behind.

BOD SUBCOMMITTEE REPORTS

BOD DEI ADVISORY SUBCOMMITTEE

Ms. Thomle reported on behalf of the subcommittee. She stated that the subcommittee had no motions for the BOD's consideration.

She provided an update on the subcommittee's ten initiatives. The full subcommittee's report was attached to the agenda.

Mr. Leung stated that he recently learned that Society is working with CIBSE to develop a circular economy; specifically, there is a joint effort to develop this next generation standard. He expressed appreciation for the opportunity to be in Istanbul, if he were not in attendance, he would not have been aware of this.

Mr. Mehboob expressed his thanks to the BOD for conducting this meeting at the RAL CRC, stating it was a visionary step.

Mr. Khankari thanked Mr. Knight and Ms. Hayter for their assistance with the book club. He requested that all BOD members attend, stating that even if members did not read the book they should still attend. He stated that unconscious bias is an important topic for Society as a volunteer organization.

He reported that there will be a cultural mixer at the Winter Conference. BOD members were asked to attend and share their cultural experiences. He stated that the event is meant to be fun and educational. He asked that everyone invite other members and colleagues to attend.

Mr. Mehboob thanked Ms. Thomle and the subcommittee for their work.

FINANCIAL FOCUS SUBCOMMITTEE

Mr. Knight reported on behalf of the subcommittee. He reviewed the subcommittee's three charges. He reported that the subcommittee is working in three two-person subgroups to address each of the three initiatives.

He reported that the subcommittee completed a first pass on the dashboards. He asked that the BOD review the dashboards and provide comments. The goal is to begin publishing the dashboards the first of December.

He reported that the subcommittee is working with the Finance Committee on limits of authority. There is a draft from the Finance Committee that the group is reviewing.

Mr. Knight reported that at every CRC and fall council meeting members of the subcommittee have been talking about financial focus and stressing the need for more detailed financial impacts when motions are brought to the BOD. He stated that refining that tool allows better access to that information so that accurate fiscal impacts can be provided with motions.

Mr. Mehboob stressed that the purpose behind creating BOD Subcommittees is to allow the BOD to be strategic. He thanked members of the BOD serving on the subcommittees, stating that they were doing great strategic work that will move the BOD forward.

SOCIETY STREAMLINING SUBCOMMITTEE

Ms. Maston reported. She stated that the group engaged Hugh Crowther and his lean process experts. The goal was to provide structure to the subcommittee's efforts. Team members have started to engage members of councils to hear what their challenges are and are gathering data.

She reported that a timeline and deliverables were not included in the update. Once the first round of information comes back the subcommittee will evaluate the information, prioritize, and put together what the deliverables will be.

Mr. Mehboob reviewed the subcommittee's charge. He stated that in light of the streamlining motion being defeated, the subcommittee's work will be focused on answering specific questions as listed in the scope.

He stated that the subcommittee's focus should be on the six subjects listed in the charge and that the group is expected to provide concrete recommendations at the spring meeting. He requested that the subcommittee focus on the scope and deliverables. He stressed that time is of the essence.

Ms. Maston stated that with all due respect, the top-down model that the BOD has tried to implement over the years has not moved the needle at all. She stated that the subcommittee is going directly to the councils and committees that report to the BOD as part of a bottom-up process. She expressed that there will be more buy in if conversations start at the council level and that driving things from the process level might be the best path to success.

Mr. Mehboob stated that it was the subcommittee's call as to how they handle the business. He stressed that answers on each of the charges was needed.

He thanked Ms. Maston and the subcommittee for their great work and expressed his thanks.

Mr. Glesne stated that Tech Council does have a desire to be autonomous, to pick their own members and not have to make large reports to the BOD. He stated that Tech Council was in agreement.

Ms. Scoggins stated that Members Council was excited at the opportunity to take on more ownership.

STRATEGIC BUSINESS DEVELOPMENT SUBCOMMITTEE

Mr. Macauley reported that the subcommittee did not have a formal report.

He stated that, per the charge, the subcommittee was tasked with developing a strategic business plan to roll out new products. He reported that the group is currently finalizing the task list, making assignments, and assigning timelines. He stated that implementation timelines would extend past the current Society year and that the group would coordinate with Pub and Ed Council to ensure that the work continues. More details will be available at the next report.

Mr. Mehboob asked how many times the subcommittee met.

Mr. Macauley responded that the group had one meeting and exchanged emails. He stated that the group would likely not have a final report by March as the planned market research would likely continue into the latter part of the Society year. He stated that the group wants to have continuous tracking of programs and products.

Mr. Mehboob stated that the BOD has discussed threats and challenges on the horizon many times. He stated that additional members can be added or the charge can be divided up among multiple groups. He stated that a strategic business plan is needed on the set deadline and stressed that it was critical to the Society.

Mr. Khankari stated that most of the Society's publications are volunteer written. Would it be strategic from a business development point of view to change our approach to a contractor approach? He suggested that an RFP be issued for strategic publications, the best proposals be selected, and Society then charge a premium price for those publications. He stated that doing so would increase revenue.

Mr. Macauley stated that some projects are already done using RFPs. He reported that Society currently utilizes both formats to get products to market. He thanked Mr. Khankari for his suggestion and stated that the subcommittee would take it under consideration.

COUNCIL REPORTS**MEMBERS COUNCIL**

Ms. Scoggins reported. There were no recommendations for the BOD's consideration. She reviewed information items. The full report was attached to the agenda.

PUBLISHING AND EDUCATION COUNCIL

Mr. Macauley reported that the council did not have an updated report since the Toronto meeting.

TECHNOLOGY COUNCIL

Ms. Maston reported. She reminded BOD members that members are to review the following motions for adherence to ASHRAE's Procedures for Standards Actions (PASA) and ANSI Essential Requirements and not technical content. If the BOD disapproves a Standards Committee Document for publication, please detail reasons for the record.

Ms. Maston moved that

9. The following motions be considered as a consent motion:

- Standards Committee recommends that BSR/ASHRAE Addendum *x (relocates exhaust requirements)* to ANSI/ASHRAE Standard 62.1-2022 *Ventilation and Acceptable Indoor Air Quality*, be approved for publication.
- Standards Committee recommends that BSR/ASHRAE Addendum *i (establishes minimum requirements for ozone emissions of air-cleaning systems)* to ANSI/ASHRAE Standard 62.2-2022, *Ventilation and Acceptable Indoor Air Quality in Residential Buildings*, be approved for publication.
- Standards Committee recommends that BSR/ASHRAE Addendum *J (prohibits the installation of unvented combustion space heaters within dwelling units)* to ANSI/ASHRAE Standard 62.2-2022, *Ventilation and Acceptable Indoor Air Quality in Residential Buildings*, be approved for publication.
- Standards Committee recommends that BSR/ASHRAE Addendum *m (minimum efficiency of certain filters)* to ANSI/ASHRAE Standard 62.2-2022, *Ventilation and Acceptable Indoor Air Quality in Residential Buildings*, be approved for publication.
- Standards Committee recommends that BSR/ANSI/ASHRAE Addendum *h (ELC revisions)* to ANSI/ASHRAE Standard 90.4-2019, *Energy Standard for Data Centers*, be approved for publication.
- Standards Committee recommends that BSR/ANSI/ASHRAE/ICC/USGBC/IES Addendum *k (Emergency Ventilation Rates)* to ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2020, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.
- Standards Committee recommends that BSR/ANSI/ASHRAE/ICC/USGBC/IES Addendum *m (Emissions and SECFs Update)* to ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2020, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.
- Standards Committee recommends that BSR/ANSI/ASHRAE/ICC/USGBC/IES Addendum *y (Prohibition of Smoking and Vaping)* to ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2020, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.

There was no discussion.

MOTION 9 PASSED (28:0:1, CNV).

Ms. Maston moved that

10. Standards Committee recommends that BSR/ASHRAE Standard 230P, *Commissioning Process for Existing Buildings and Systems*, be approved for publication.

MOTION 10 PASSED (27:0:2, CNV). Mr. Conlan and Ms. Maston abstained.

Ms. Maston moved that

11. The following motions be considered as a consent motion:

- Technology Council recommends that proposed changes to the Procedures for ASHRAE Standards Actions (PASA) within Section 4. Approval Of Proposed Standards, Section 5. Relationships with other Standards-Developing Organizations, Section 7. Criteria for Approval, Withdrawal, and Discontinuance of ASHRAE Standards and Guidelines, Annex A1: Definitions, Annex B: Appeals of Board of Directors' Standards Actions or Inactions, and Annex C: Complaints of Actions or Inactions by the StdC, its Subcommittees or PCs, be approved as shown in ATTACHMENT D.
- Tech Council recommends that proposed changes to the Rules of the Board Section 2.425.001 *Scope and Purpose*, and Section 2.425.003 *Operation*, be approved as shown in ATTACHMENT E.

Ms. Maston reported that the redline changes to the ROB are proposed in an effort to streamline processes. At the Toronto meeting the motion was tabled to allow members time to review changes. She reported that the proposed change was also shared as an information item with Tech Council and the BOD.

No additional changes have been made to the proposed edits since June.

She reported that, if approved, the proposed changes to PASA would move forward for public review with ANSI. That process could take six months to a year, depending on the comments received.

Ms. Thomle commended and thanked Ms. Hanson and the Standards Committee for their work on this. She stated that the edits were a lot of work and a streamlining effort.

MOTION 11 PASSED (27:0:0, CNV).

Ms. Hanson stated that staff did a lot of work on the proposed edits. She stated that she did not abstain from the vote because she had not voted on this item at any other level and therefore felt it was appropriate to vote.

Mr. Mehboob stated that tremendous work went into the proposed edits and that they speak to the Society's streamlining.

Mr. Littleton reported that in addition to removing the BOD from the Standards approval process for addenda, the change also eliminates the requirement for a super majority when voting for Standards addenda. He expressed that not requiring a super majority would allow Standards addenda approval to happen even faster.

Ms. Maston moved that

12. Technology Council recommends that the Board of Directors approve the revised *Infectious Aerosols* position document (PD) as shown in Attachment F.

Ms. Maston reported that this PD is a revision to the current ASHRAE position document on Infectious Aerosols published April 14, 2020. This version was sent to the BOD on September 9th. An earlier version (version 5) of this PD was sent to BOD members on May 21, 2022, with a request for review and comments. The May 21, 2022 version was also sent to the BOD on September 9th for comparison. Comments were collected, sent to the PD committee and considered and/or addressed by the PD committee in the latest draft. There is not a track changes version comparing V9 to V5 as the format was drastically changed to conform with the new PD format approved by the Document Review Subcommittee (DRSC) and Tech Council in Toronto. The DRSC vote was 6-0-1, CNV. The PD Committee unanimously approved the document. If approved by the BOD, ASHRAE editing staff will work with the PD Chair and make any editorial changes deemed necessary prior to publishing the website.

MOTION 12 PASSED (Unanimous Voice Vote, CNV).

It was asked if an MTG had been established for the Infectious Aerosols PD.

Mr. Conlan responded that Mr. Hermans started an MTG with the intent of taking research projects from the ETF. He stated that he believes this is the MTG being asked about but he can get confirmation.

Mr. Khankari stated that there was effort taken by the committee to weigh the importance of different measures and their effectiveness. He stated that the committee was small enough to reach some conclusions. He reported that the committee strongly recommends that this be taken as the MTG and come up with recommendations.

Ms. Maston reviewed the council's information items.

COMMITTEE REPORTS

DEVELOPMENT COMMITTEE

Mr. Austin reported that he would be presenting as ExO on behalf of the chair. There were no motions for the BOD's consideration. Mr. Austin reviewed the committee's information items.

Mr. Austin reported that when seeking support from private foundations it is critical to show that 100% of the BOD provides monetary support of ASHRAE's mission. In the coming weeks, members of the Development Committee will be reaching out to BOD members individually. Please, when you hear from the Committee, please help them do their job and assist the Society in securing funding.

AUDIT COMMITTEE

Ms. Jensen reported that the Audit Committee has not met yet because the fall meeting centers around the audit, which is not complete. The committee will have a report to the BOD at the Winter Meeting in Atlanta.

ASHRAE BRAND RECOGNITION

Mr. Mehboob reported that Mr. Kishor and his group have been working on brand recognition. He expressed appreciation to the Marketing department and stated that they are doing a great job; this group is not meant to overstep.

Mr. Khankari thanked Mr. Mehboob for recognizing the strategic importance of this topic. He thanked previous subcommittee members for their work. He reported that staff are now members of the subcommittee. He stated that the subcommittee's charge is steep and that they will get their work going soon. BOD members were invited to attend the group's meetings.

Ms. Scoggins expressed that there was a need for a public awareness campaign as people do not equate buildings and building emissions with climate change. She suggested that this could be a possible fundraising opportunity.

Mr. Mehboob expressed agreement with Ms. Scoggins and asked that the subcommittee make a public awareness campaign a part of their work. He thanked Ms. Scoggins for her suggestion.

TASK GROUP REPORTS

ASHRAE AT INTERNATIONAL CONFERENCES TASK GROUP

Mr. Sepulveda reported. The full report was attached to the agenda. He reported that 20% of Society's members are outside of North America. He stated that the global summit at the RAL CRC is an excellent reminder that things also happen outside of North America.

He stated that it is important to demonstrate that Society operates globally. He suggested that what is done each year should be considered, and those future events be coordinated with the CRCs.

The floor was opened for discussion. A summary of that discussion is below:

Cheng - Reported that Region XIII holds a conference every two years. Therefore, the Society does have a conference outside of North America every two years.

Leung - That there are financial and growth benefits to international conferences. Should be done every year. If we want to truly serve the world, cannot stay home, have to go out.

Rakheja – RAL has already demonstrated a cost neutral model to Society. Should encourage similar meetings at least once a year.

RAL received a tremendous response from potential sponsors and companies. The room was full of attendees. Suggested that a good cost model can be worked out.

Mehboob – This event was not cost neutral. He reported that there is \$50,000-60,000 for consideration.

Scoggins – Getting a lot of comments for next year. What is your recommendation?

Sepulveda – Our recommendation is that a conference be held every year, possibly with rolling themes. Every year there should be a big event outside of North America every year.

Leung – Developers have deep pockets; supplest we focus on health and decarbonization and invite developers to be sponsors.

Constantinide – Region XII will have CRCs in Barbados, Brazil, and Ecuador in the coming three years. From a cost standpoint, this is a cost to Society, but it should be looked at as more of an investment.

If we reach out to other countries this is where we can look at standards implementation in other countries. Having a presence, especially a conference, speaks volumes from a government outreach standpoint.

Mr. Mehboob summarized that one question is frequency. Are we in favor of doing something annually? Feel we have consensus that something should be done every year.

Second question, what type of event, financials, and who would organize?

Ms. Scoggins stated that her plan is to place President Mehboob in charge of defining this event for the next Society year.

Mr. Mehboob stated that he would be more than happy to do whatever is needed to make Ms. Scoggins a success.

Ms. Abrams requested that Tony Giometti be included when these discussions are happening.

Mr. Knight reported that, to Ms. Abrams' point, Mr. Giometti has already been engaged along with CIBSE to start thinking about some type of building performance analysis conference. He suggested that this specialty conference could be done with other events around it. He reported that there are no details yet and discussions are in the very early stages.

Mr. Mehboob thanked Mr. Sepulveda and his team for all the work done. He expressed that Mr. Sepulveda won his point and congratulated him and the team.

CHAMPIONS CLUB

Mr. Wentz reported. He stated that this group is one of President Mehboob's vision. The full report was attached to the agenda.

He reported that there are six pillars of President Mehboob's vision. Presidential initiatives were color coded to reflect which of the six pillars they supported, along with a list identifying the champion of that item. Items highlighted in yellow are complete, blue items (with the exception of one) will be completed this Society year. This is the process that the group is using to identify and monitor the initiatives that support the Society theme. He then reviewed the initiatives and progress.

The group meets quarterly and has met once thus far.

Mr. Wentz reported that the HVAC summit was a new and strategic approach and was designed to be a strategic event. The summit was by invitation only and a great deal of time was spent identifying who was going to be invited. Thought diversity was important and invitees were selected by geographical location, what segment of the industry they were in, and their leadership.

He reported that the goal of the summit was to have a deliverable packet that will be delivered by the end of the year. This conference was a call to action and he expressed that the BOD will be impressed with the call to action deliverables.

The group will not be providing the BOD with recommendations. Instead, the group will report the voice of the customer.

Mr. Mehboob thanked Mr. Wentz and his team and stated that he was grateful for his service.

Mr. Wentz advised that members of the BOD would be receiving an evaluation of the summit. He strongly encouraged all BOD members to complete the evaluation.

He reported that the summit was not perfect in facilitating strategic conversations and weaknesses in the approach have been identified. A committee to improve the summit is prepared to make necessary changes if the BOD decides to host another summit.

NEW BUSINESS

SOCIETY AND NET ZERO OPERATIONAL CARBON

Mr. Leung proposed that Society investigate what it would cost, using Ms. Scoggins' leadership report on scope one, two, and three emissions, for Society to get to net zero operational carbon for the first time in history.

Ms. Scoggins reported that Society has evaluated proposals and contracted with SCS Global. The organization will provide guidance and suggestions on scope one, two, and three emissions and provide information on how to reduce those emissions.

She stated that Society would be the first organization that we are aware of, working toward zero emissions as an organization.

Ms. Scoggins and her group will have their first meeting with SCS Global in a few weeks. The goal is to have a report to the BOD in the next few months.

Mr. Khankari led the BOD in thanking Mr. Mehboob for his leadership in regard to this meeting. Thanks were bestowed on RAL for wonderful accommodations and organization of the event. The full BOD applauded as a show of their appreciation and thanks.

EXECUTIVE SESSION

Executive session was called at 12:16 pm.

Open session reconvened at 12:28 pm.

INFORMATION ITEMS

PUBLICATION ANALYSIS SHEETS

Mr. Littleton reported that the analysis sheets attached to the agenda are the BOD's opportunity to have an advance look at addenda that will come before the body. The analysis sheets attached to the agenda were reviewed by the BOD for approval at this meeting during the Technology Council report. There is no need for additional review or discussion at this time.

UPCOMING MEETINGS

Mr. Mehboob reviewed the time and date for the December BOD Election as well as the BOD meetings at the 2023 Winter Conference in Atlanta.

ADJOURNMENT

The meeting adjourned at 12:30 pm.

A handwritten signature in black ink, appearing to be 'JH Littleton', with a horizontal line extending to the right.

Jeff H. Littleton, Secretary

ATTACHMENTS:

- A. UAE Ministry of Energy MOU
- B. Toronto Scholarship Agreement
- C. TFBD ExCom Report
- D. PASA Section 4 Proposed Edits
- E. ROB 2.425.003 Proposed Edits
- F. Infectious Aerosols Position Document



MEMORANDUM OF UNDERSTANDING

مذكرة تفاهم

between

بين

Ministry of Energy and Infrastructure

وزارة الطاقة والبنية التحتية،

and

و

The American Society of Heating, Refrigerating and Air-
Conditioning Engineers

الجمعية الأمريكية لمهندسي التدفئة والتبريد وتكييف الهواء

Dated \بتاريخ: -----

United Arab Emirate

الإمارات العربية المتحدة



MEMORANDUM OF UNDERSTANDING

مذكرة تفاهم

It is on this day...../.../.../2022, agreed by and between:

إنه في يوم الموافق/...../2022، تم الاتفاق بين كل من:

(1) The Ministry of Energy and Infrastructure, represented herein by H.E....., in his capacity as....., having its address in the UAE, located in.....Emirate, PO. Box....., Telephone....., Fax..... (hereinafter referred to as First Party)

(1) وزارة الطاقة والبنية التحتية، يُمثلها في التوقيع على هذه المذكرة: سعادة : بصفته.....، وعنوانها: بدولة الإمارات العربية المتحدة، ومقرها إمارة.....، ص.ب: هاتف.....، فاكس..... (.....). (ويُشار إليها فيما بعد "الطرف الأول").

(2) The American Society of Heating, Refrigerating and Air-Conditioning Engineers, represented herein by H.E....., in his capacity as....., having its address in the UAE, located in.....Emirate, PO. Box....., Telephone....., Fax..... (hereinafter referred to as Second Party)

(2) الجمعية الأمريكية لمهندسي التدفئة والتبريد وتكييف الهواء ويُمثلها في التوقيع على هذه المذكرة: سعادة (.....) بصفته.....، وعنوانها: بدولة الإمارات العربية المتحدة، ومقرها إمارة.....، ص.ب: هاتف.....، فاكس..... (.....) (ويُشار إليها فيما بعد "الطرف الثاني").

(Each hereinafter referred to individually as a Party ("Party") and collectively as the Parties)

(ويُشار إلى كل منهم منفرداً بلفظ "الطرف" وإليها مجتمعين بلفظ "الطرفين / الطرفان")

Preamble

Proceeding from the Leadership vision and the strategic directions of the UAE, the keenness of the Parties to establish the joint strategic cooperation between them, benefiting from the services provided by them, in a way that ensures achievement of institutional integration between the parties.

التمهيد

انطلاقاً من رؤية القيادة والتوجهات الإستراتيجية للدولة وحرص الطرفين على إرساء أسس التعاون الإستراتيجي المشترك بينهما والاستفادة من الخدمات المقدمة من الطرفين بما يضمن تحقيق التكامل المؤسسي بين الطرفين.

Whereas, the importance of the present Memorandum lies in developing and strengthening cooperation relationships between the Parties, which contributes to organizing, coordinating, the procedures and legal systems in force between the Parties, in pursuance to an institutional framework that consistent with each party's obligations and competencies;

وحيث تكمن أهمية المذكرة الماثلة في تطوير وتعزيز علاقات التعاون بين الطرفين مما يسهم في التنظيم والتنسيق والإجراءات والأنظمة القانونية المعمول بها بين الطرفين وفق إطار مؤسسي يتوافق مع التزامات واختصاصات كل طرف.



Whereas, the First Party (MOEI) is a federal entity incorporated by virtue of Decretal Federal Law No. (16) of 2020 Amending Certain Provisions of Federal Law No. (1) of 1972 On the Powers of the Ministries and Competencies of the Ministers, as amended, which could be referred to hereinafter as (First Party);

As the Second Party, The American Society of Heating, Refrigerating and Air-Conditioning Engineers, is the competent authority for standards, guidelines, and scientific research to arrive at knowledge society with global competitiveness that satisfies the future requirements of the labor market by ensuring the quality of outcomes and providing distinguished services to internal and external customers, hereinafter be referred to as the “Second Party”.

In accordance with the strategic visions of both parties and the strengthening of collaboration and coordination between the Ministry of Energy and Infrastructure and The American Society of Heating, Refrigerating and Air-Conditioning Engineers, the two parties agreed to conclude this Memorandum and develop an official framework between them according to the following terms:

1. Objective

This Memorandum aims at strengthening cooperation between the two parties and achieving successful strategic partnership through developing the main common frameworks and coordination with the Stakeholders to find current and future ways of cooperation in various fields, to benefit from the accumulated mutual experiences of both parties and exchange studies and research aimed at improving the institutional work, in order to establish partnership between the Parties to attain common strategic objectives, developing

حيث ان الطرف الأول وزارة الطاقة والبنية التحتية اتحادية أنشأت بموجب المرسوم بالقانون الاتحادي رقم (16) لسنة 2020 بشأن تعديل بعض احكام القانون الاتحادي رقم (1) لسنة 1972 بشأن اختصاصات الوزارات وصلاحيات الوزراء وتعديلاته ويمكن أن يشار له فيما بعد بـ " الطرف الأول "

ولكون الطرف الثاني الجمعية الأمريكية لمهندسي التدفئة والتبريد وتكييف الهواء هي الجهة المختصة بالمواصفات والأدلة الاستراتيجية والبحث العلمي وصولاً لمجتمع معرفي ذي تنافسية عالمية ويلبي احتياجات سوق العمل المستقبلية وذلك من خلال ضمان جودة المخرجات وتقديم خدمات متميزة للمتعاملين الداخليين والخارجيين. ويمكن أن يشار له فيما بعد بـ " الطرف الثاني "

ووفقاً للخطة الإستراتيجية لكلا الطرفين وتعزيز أواصر التعاون والتنسيق بين وزارة الطاقة والبنية التحتية الجمعية الأمريكية لمهندسي التدفئة والتبريد وتكييف الهواء فقد اتفق الطرفان على إبرام هذه المذكرة ووضع إطار عمل رسمية بينهما طبقاً للمواد التالية:

1. الهدف:

تهدف هذه المذكرة إلى تعزيز أواصر التعاون بين الطرفين وتحقيق الشراكة الاستراتيجية المثمرة من خلال وضع أطر العمل الرئيسية المشتركة والتنسيق مع الجهات المختصة لإيجاد سبل التعاون الحالية والمستقبلية في مختلف المجالات، والاستفادة من الخبرات التراكمية المتبادلة لدى كل من الطرفين وتبادل الدراسات والبحوث الرامية إلى تجويد العمل المؤسسي لبناء علاقة شراكة بين الطرفين لتحقيق الأهداف الاستراتيجية المشتركة، وتطوير الخدمات الفنية للمشاريع، وتنسيق مجالات العمل المشترك، بغية تحسين أداء العمليات وتبسيط الإجراءات



technical services for the projects, coordinating areas of joint work, in order to enhance the performance of operations, simplify the procedures, collaboration between the Parties within the framework of joint functional and practical cooperation to develop technical and administrative capacities of both Parties' Employees.

والتنسيق بين الطرفين في إطار التعاون الوظيفي والعمل المشترك لتنمية القدرات الفنية والإدارية لموظفي الطرفين.

2. Areas of Cooperation:

-2 مجالات التعاون:

First Party's Commitments:

أولاً: أوجه التعاون من قبل الطرف الأول

1. To coordinate and collaborate to pave the way to benefiting from the Ministry's practical experience in planning, designing, executing, managing and maintenance of infrastructure projects within the UAE, which have been carried out by it. Regulating and developing the Energy, Water and Mining Sector, regulating and developing the Land, Maritime Transportation and Railway Sector in the UAE, through coordination with the Second Party in the fields related to educational awareness, Artificial Intelligence and regulatory policy making.
2. Provide the Second Party with any analytical studies in infrastructure projects, energy, water, mining, and transportation and making the same available within the legal framework of property rights and the exchange of information.
3. Collaborate and coordinate in order to provide the Second Party the opportunity to participate in technical competitions and awards offered by the Ministry.

1. التنسيق والتعاون لإتاحة الاستفادة من خبرات الوزارة العملية في تخطيط وتصميم وتنفيذ وإدارة وصيانة مشاريع البنية التحتية بالدولة والمنفذة من قبلها، تنظيم وتنمية قطاع الطاقة والمياه والتعدين، تنظيم وتطوير قطاع شؤون النقل البري والبحري و السكك الحديدية في الدولة وذلك من خلال التنسيق مع الطرف الثاني في المجالات المتعلقة بالتوعية التعليمية والذكاء الاصطناعي وصنع السياسات التنظيمية.
2. التنسيق والتعاون لتزويد الطرف الثاني بأية دراسات تحليلية في مشاريع البنية التحتية، الطاقة، المياه، التعدين والنقل وجعلها متاحة ضمن الإطار القانوني لحقوق الملكية وتبادل المعلومات.
3. التنسيق والتعاون للإتاحة الطرف الثاني للمشاركة في المسابقات والجوائز الفنية التي تطرحها الوزارة.

Second Party's Commitments:

1. Collaborate with the First Party in exchange of experiences in the fields of

ثانياً: أوجه التعاون من قبل الطرف الثاني



- Infrastructure, Energy, Water, Mining and Transportation.
2. Joint collaboration and coordination in preparation of standard specifications and national codes and guidelines related to construction in infrastructure projects, Energy, Water, Mining and Transportation.
 3. Developing of training programs, professional and scientific development, workshops and conferences related to the Ministry's fields of work.
 4. Cooperation in conducting joint technical studies and research that serve the fields of infrastructure, energy, water, mining, and transportation.

3. Communication and Exchange of Information

3.1 The parties shall, regularly, agree on exchange of information and understanding in matters of common interest, which in their opinion are likely lead to their mutual collaboration.

4. Implementation Arrangements

4.1 When the Parties are desirous to engage in more specific cooperation (such as projects and private events), under the framework of this Memorandum, they shall sign off another Memorandum of Cooperation or an addendum to this Memorandum that covers the Parties' responsibilities and areas of cooperation, where such a memorandum shall be separate for a specific project to be carried out and executed based on this Memorandum, which shall include a clause that refers to this Memorandum, where the programs and projects resulted hereof.

1. التنسيق مع الطرف الأول في تبادل الخبرات في مجالات البنية التحتية، الطاقة، المياه، التعدين و النقل.
2. التنسيق والتعاون المشترك في اعداد المواصفات القياسية والأدلة الاسترشادية والكودات الوطنية الخاصة بالإنشاءات بمشاريع البنية التحتية، الطاقة، المياه، التعدين والنقل.
3. تنظيم برامج التدريب والتطوير المهني والعلمي وورش العمل والمؤتمرات المتعلقة بمجالات عمل الوزارة.
4. التعاون في إعداد دراسات و بحوث فنية مشتركة تخدم مجالات البنية التحتية، الطاقة، المياه ، التعدين والنقل

3- الاتصال وتبادل المعلومات:

3.1 يتفق الأطراف وبشكل دوري على تبادل المعلومات والتفاهم في الامور ذات الاهتمام المشترك، والتي بنظرهم قد تؤدي للتعاون المشترك.

4- الإجراءات التنفيذية

4.1 عندما يود الأطراف الدخول في تعاون أكثر تحديداً (كالمشاريع والفعاليات الخاصة) تحت مظلة مذكرة التفاهم هذه، يوقع الأطراف مذكرة تعاون أخرى أو ملحق لهذه المذكرة، يغطي مسؤوليات الأطراف وأوجه التعاون. على كل مذكرة منفصلة لمشروع محدد أن يتم وينفذ بناء على مذكرة التفاهم هذه. وعليه أن يشمل بنداً يشير إلى مذكرة التفاهم هذه، والتي تنطبق عليها وعلى البرامج والمشاريع الناتجة عنها.



4.2 This MOU, per se, shall not impose any financial obligations on either party.

4.2 في حد ذاتها، لا تفرض مذكرة التفاهم هذه أية التزامات مالية لأي من الأطراف.

5. Trademark and Communications

5- العلامة التجارية والاتصال

5.1 Neither Party shall use the name, logo or trademarks of the other party or any abbreviation thereof, in connection with its business without obtaining prior written approval of the other Party in each case.

5.1 لا يجوز لأي طرف استخدام اسم أو شعار أو العلامات التجارية للطرف الآخر أو اختصاراتها في أعماله بدون موافقة خطية مسبقة من الطرف الآخر في كل مرة يتم فيها الاستخدام.

5.2 Each party acknowledge that it is familiar with principles and objectives of the other party and recognizes that its name and logo shall not be used in a manner inconsistent with the brand guidelines.

5.2 يقر كل طرف بأنه على دراية بالمثل والأهداف للطرف الآخر، وأنه لن يستخدم اسم وشعار الطرف الآخر بطريقة لا تتفق مع الدليل الخاص باستخدامه.

5.3 Parties agree to approve and endorse this partnership, as required. Each Party shall inform the other party and share with it all publications and promotional materials prior their use and display, to obtain a written approval from the other party before initiating printing, publication or general distribution.

5.3 تتفق الأطراف على الموافقة واعتماد هذه الشراكة، حسب الاقتضاء وعلى كل طرف إبلاغ الطرف الآخر ومشاركته بكل المنشورات والمواد الترويجية قبل استخدامها والعرض العام لها، والحصول على موافقة خطية من كل طرف قبل الشروع بالطباعة أو النشر أو التوزيع العام.

5.4 Any external communication with the media regarding the partnership from either party shall be agreed upon in writing.

5.4 يتم الاتفاق كتابياً على أي اتصال مع وسائل الإعلام حول الشراكة من قبل أي من الأطراف.

5.5 Neither party shall speak nor make public statements on behalf of the other party, nor claim to represent it, except in specific cases where express agreement is given in writing.

5.5 لا يجوز لأي طرف التحدث أو التصريح بالنيابة عن الطرف الآخر أو ادعاء تمثيله، إلا في حالات محدودة يتم الاتفاق عليها خطياً بشكل مسبق.

6. Legal Compliance

6- الامتثال القانوني:

Each party shall cooperate in the activities envisaged under this MOU in accordance with their own internal regulations, rules, and by-laws. Specific activities determined under this MOU that

سوف يتعاون كل طرف مع الأنشطة المفروضة بموجب مذكرة التفاهم هذه وفقاً للوائح والقواعد والتعليمات الداخلية الخاصة به. أي أنشطة محددة في هذه المذكرة والتي تتطلب التزامات أو



require financial commitments or liabilities of either party shall be subject to separate written agreements.

مسؤوليات مالية من أي من الأطراف ستخضع لاتفاقات مكتوبة منفصلة.

7. Duration, Termination and Modification of this memorandum

7- مدة المذكرة وإلغاؤها وتعديلها

7.1 This MOU shall enter into force for two years, on the date of signing off by authorized signatories.

7.1 يسري مفعول هذه المذكرة لمدة سنتين من تاريخ التوقيع عليها من قبل المفوضين.

7.2 Either party may terminate this MOU by virtue of written notice to be addressed to the other party one month of its expiry. In the event of termination, the parties shall undertake all measures for quick and organized termination for its activities, as well as termination of such activities instigated within separated arrangements under the MOU, as mutually agreed. Where a party breached the conditions of the MOU, then it may be terminated without prior notice.

7.2 يمكن لأي من الأطراف إنهاء مذكرة التفاهم الماثلة بموجب إشعار خطي يرسله إلى الطرف الآخر قبل شهر من تاريخ الانتهاء. في حال الإنهاء، فإن الأطراف تتخذ جميع الخطوات لتحقيق نهاية سريعة ومنظمة لأنشطتها، وكذلك إنهاء الأنشطة التي بدأت في إطار ترتيبات منفصلة مبرمة تحت مذكرة التفاهم كما هو متفق عليه بين الأطراف. في حال خرق أي من الأطراف شروط مذكرة التفاهم، يجوز إنهاؤها دون سابق إنذار.

7.3 This MOU may be amended by mutual consent, provided that one of the parties notifies the other in writing of the proposed amendment.

7.3 يجوز تعديل هذه المذكرة بموافقة الأطراف، شريطة أن يقوم أحد الأطراف بإخطار الطرف الآخر خطياً عن التعديل المقترح.

8. Privileges

8- امتيازات

Nothing in or relating to this MOU shall be deemed a waiver, expressed, or implied of any of the privileges.

لا شيء ضمن أو في ما يتعلق بمذكرة التفاهم الماثلة يعتبر تنازلاً، صريحاً أو ضمناً عن أي من الامتيازات للأطراف.

9. ASSIGNMENT

9- التنازل

Neither Party may assign or otherwise transfer any of its rights or obligations under this MOU, in whole or in part, to a third party, unless agreed in advance by the other Party.

لا يجوز لأي طرف التنازل عما جاء في هذه المذكرة أو تحويلها بشكل جزئي أو كلي إلى الغير دون موافقة خطية مسبقة من الطرف الآخر.

10. APPLICABLE LAW AND DISPUTES SETTLEMENT

10. القانون واجب التطبيق وتسوية النزاعات



The Parties agreed that in the event of any disagreement or dispute arising out of, or in connection with, the implementation of this MOU, the Arabic languages shall be used to construe its provisions. The Parties shall exert their efforts to arrive at amicable solution, settle the dispute in question, wherein this MOU shall not be considered as legal contract between the Parties.

اتفق الطرفان على أنه في حال وجود أي خلاف أو نزاع ينشأ عن تنفيذ مذكرة التفاهم الماثلة أو بخصوصها، تستخدم اللغة العربية لتفسير أحكامها، ويبذل الطرفان جهودهما للتوصل إلى حلٍ ودي وتسوية المسألة محل النزاع حيث لا تعد هذه المذكرة عقد قانوني بين الطرفين

11. CONFIDENTIALITY

11- السرية

The Parties shall maintain the confidentiality and existent of this MOU, objective, content and all confidential information. Neither Party shall utilize confidential information for their commercial purposes, disclose of any confidential information to third parties without procuring the other party's consent. For the purposes of Article (6), "Confidential Information" shall mean all information, regardless of its nature, wholly or partially related to any project or either party's affairs:

يلتزم الطرفان بالحفاظ على سرية وجودة هذه المذكرة وغرضها ومضمونها وجميع المعلومات السرية، وعليه ألا يستخدم أي معلومات سرية لأغراضه التجارية الخاصة أو الكشف عن أي معلومات سرية لأغراضه التجارية لأي طرف ثالث دون موافقة الطرف الآخر. ولأغراض هذه المادة 6، تعني "المعلومات السرية" جميع المعلومات، مهما كانت طبيعتها، المتعلقة كليًا أو جزئيًا بأي مشروع أو شؤون أي طرف:

- Provided by a party or on its behalf to the other party, whether orally, in writing or otherwise, and whether before or after the date of this MOU.
- Obtained by a party, in writing or orally, through or after discussions with the Management, Staff, Agents or Consultants of other Party.
- Acquired by observation or attendance by a Party at the offices or other premises of the other Party; or

- يتم تقديمها من قبل طرف أو نيابة عنه إلى الطرف الآخر سواء كان ذلك شفويًا أو خطيًا أو غير ذلك، وسواء كان ذلك قبل تاريخ هذه المذكرة أو بعده.
- يتم الحصول عليها من قبل أحد الطرفين خطيًا أو شفويًا، من خلال أو بعد مناقشات مع الإدارة أو الموظفين أو الوكلاء أو المستشارين التابعين للطرف الآخر؛
- يتم اكتسابها عن طريق ملاحظة أو حضور أحد الطرفين في المكاتب أو الأماكن الأخرى الخاصة بالطرف الآخر

Each Party shall take all appropriate procedures to ensure that the confidentiality of the Confidential Information is preserved.

يتعين على كل طرف أن يتخذ جميع الإجراءات المناسبة لضمان الحفاظ على سرية المعلومات السرية.

Article 6 of this MOU shall not prohibit disclosure or use of any information if and to the extent:

- لا تحظر المادة 6 من المذكرة الماثلة الكشف عن أو استخدام أي معلومات إذا كانت هذه المعلومات وفي حدود ما يلي:
- المعلومات أصبحت متاحة للجمهور (بأي طريقة أخرى لا تُشكل خرقًا لهذه المذكرة).



- The other Party has given prior written approval to the disclosure or use.
 - The information is independently developed by a Party after the date of this MOU.
 - The disclosure or use is required by applicable Law on which the shares of either party or any of its Subsidiaries is listed.
 - The disclosure or use is required for the purpose of any judicial or arbitral proceedings arising out of this MOU or any documents to be entered pursuant to it.
 - The disclosure of information to any competent tax authority to the extent such disclosure is reasonably required for the purposes of the tax affairs of the Party concerned or any of its Affiliates.
 - The disclosure of information by a Party to its Affiliates, and its respective directors, officers, employees, agents and advisers on a need-to-know basis and on terms that such parties undertake to comply with the provisions of this Clause 6 as if they were a party to this MOU.
- أعطى الطرف الآخر موافقة خطية مسبقة للكشف عنها أو استخدامها.
- تم تطوير المعلومات بشكل مستقل من قبل الطرف بعد تاريخ هذه المذكرة.
- إن كان الإفصاح أو الاستخدام مطلوباً بموجب القانون المعمول به الذي يتم سرد أسهم أي من الطرفين أو أي من الشركات التابعة لها بموجبه.
- إن كان الإفصاح أو الاستخدام مطلوباً لغرض أي إجراءات قضائية أو تحكيمية ناشئة عن هذه المذكرة أو أي وثائق يتم إدخالها بموجبه.
- إن كان الإفصاح عن المعلومات مطلوباً لأي سلطة ضريبية مختصة بالقدر الذي يكون فيه هذا الإفصاح مطلوباً بشكل معقول لأغراض الشؤون الضريبية للطرف المعني أو أي من الشركات التابعة له.
- إن كان الإفصاح عن المعلومات من قبل أحد الطرفين إلى الشركات التابعة له ومديره وموظفيه وعماله ووكلائه والمستشارين التابعين لها بشأن الحاجة إلى معرفة الأساس وبالشروط التي تتعهد بها تلك الأطراف بالامتثال لأحكام هذه المادة 6، كما لو كانت طرف في هذه المذكرة

Except as required by applicable law, each Party agrees that it will not issue or release for external publication any article or advertising or publicity matter relating to this MOU or the Projects without the prior written consent of the other Party, which consent shall not be unreasonably withheld or delayed.

The Parties acknowledge and agree that damages would not be an adequate remedy for any breach of this Article No. 6 and the remedies of injunction, specific performance and other equitable relief are appropriate for any threatened or actual breach of any such provision and no proof of special damages shall be necessary for the enforcement of the rights under this Article 6.

باستثناء ما يقتضيه القانون النافذ، يوافق كل طرف على أنه لن يصدر أو يقدم للنشر الخارجي أي مقال أو إعلان أو مسألة إشهار متعلقة بهذه المذكرة أو المشروعات بدون موافقة خطية مسبقة من الطرف الآخر، والتي لا يجوز حججها أو تأخيرها بشكل غير معقول.

يقر الطرفان ويوافقان على أن التعويضات لن تكون سبيل انتصاف مناسب لأي خرق لهذه المادة رقم 6، كما الأوامر التحذيرية، والأداء المحدد وغير ذلك من سبل الإنصاف العادل ملائمة لأي خرق مهدد أو فعلي لأي حكم من هذا القبيل، ولا يكون أي دليل على وجود أضرار خاصة ضرورياً لإنفاذ الحقوق بموجب هذه المادة 6.



The Parties agree that they shall enter into an applicable Confidentiality MOU in respect of each Project at the appropriate time.

يوافق الطرفان على ضرورة الدخول في مذكرة سرية سارية فيما يتعلق بكل مشروع في الوقت المناسب.

13-General

13-أحكام عامة

1. Each Party shall bear its own costs and expenses (including due taxes) incurred in connection with the execution of this MOU unless otherwise agreed by the Parties. In case of any costs, expenses or fees resulting from execution of this MOU, they should be paid in accordance with the Action Plan and Schedule for execution of such works, which is mutually illustrated in the Addendum herewith.

1- يتحمل كل طرف التكاليف والنفقات الخاصة به (بما في ذلك الضرائب المستحقة) والناشئة عن تنفيذ هذه المذكرة ما لم يتفق الطرفان على غير ذلك وفي حال وجود أي تكاليف أو مصاريف أو رسوم تنتج عن تنفيذ هذه المذكرة فيتم سدادها وفقاً لخطة العمل والبرنامج الزمني لإنجاز تلك الأعمال والموضح اتفاقاً بمحلق هذه المذكرة.

2. References to Preamble and Articles are be references to Preamble, Articles or Sub-Articles of this MOU.

2- الإشارات إلى التمهيد والمواد هي إشارات إلى التمهيد أو المواد أو المواد الفرعية الواردة في هذه المذكرة

3. This MOU creates partnership, assignment or engagement; yet, it does not authorize any party to act as an agent, service provider or an employee of other party.

3- تُنشئ هذه المذكرة علاقة شراكة أو ارتباط أو تكليف ولا أن تُفوض أي من الطرفين بالعمل كوكيل أو مقدم خدمات أو موظف للطرف الآخر.

4. No amendments, changes to this MOU shall be effective unless agreed by the Parties, made in writing and signed by the duly authorized representatives of the Parties.

4_ لن تكون أي تعديلات أو تغييرات على هذه المذكرة سارية المفعول ما لم يتفق الطرفان عليها وتتم كتابتها وتوقيعها من الممثلين المعتمدين للطرفين حسب الأصول.

5. The Parties shall commit and comply with intellectual property laws, in force in the UAE, which includes but not limited to intellectual property rights related to the Name, Trademark, Logos, Application software, Patents and any other intellectual property rights.

5- على الطرفان الالتزام والامتثال لقوانين حقوق الملكية الفكرية المعمول بها داخل دولة الإمارات وهذا يشمل المثال لا الحصر حقوق الملكية الفكرية المتعلقة بالاسم والعلامة التجارية والشعارات والبرامج التطبيقية وبراءات الاختراع وأي حقوق ملكية فكرية أخرى.

6. This MOU may be executed by one or more Parties to any counterparty, each of which shall be deemed an original and all of which

6- يجوز تحرير هذا المذكرة من طرف واحد أو أكثر بأي عدد من النسخ المطابقة، وتُعتبر كل نسخة أصلية وتشكل جميعها معاً المذكرة ذاتها.



together shall constitute one and the same MOU.

7. All notices and other communications required or authorized to be given under this MOU shall be sufficient and effective when the same is in writing and either personally served to an officer of the Party to whom it is given or mailed by registered or certified mail, return receipt requested, postage pre-paid, addressed as follows:

7- تكون جميع الإشعارات والمراسلات الأخرى المطلوبة أو المصرح بها بموجب هذه المذكرة كافية وسارية عندما تكون خطية وترسل إما شخصياً لأحد مسؤولي الطرف الذي أُعطيت له أو تُرسل عن طريق البريد المسجل أو المعتمد، شريطة تلقي إيصال استلام، والبريد المدفوع مسبقاً، على أن يتم توجيهها إلى العناوين التالية:

إشهاداً على ما تقدم، وقع ممثلو وزارة الطاقة و البنية التحتية و الجمعية الأمريكية لمهندسي التدفئة والتبريد وتكييف الهواء

IN WITNESS WHEREOF the representatives of Ministry of Energy and Infrastructure and The American Society of Heating, Refrigerating and Air-Conditioning Engineers do affix their signatures:

رئيس الجمعية الأمريكية لمهندسي التدفئة والتبريد وتكييف الهواء Chairman of The American Society of Heating, Refrigerating and Air-Conditioning Engineers	وكيل وزارة وزارة الطاقة والبنية التحتية Undersecretary of the Ministry of Energy and Infrastructure.
Name: الاسم	Name: الاسم
Signature: التوقيع	Signature: التوقيع
Date: التاريخ	Date: التاريخ

**ENDOWED GIFT AGREEMENT BETWEEN
TORONTO CHAPTER OF ASHRAE
AND
ASHRAE FOUNDATION, INC.**



This Agreement is between the **Toronto Chapter of ASHRAE (Donor)** and **ASHRAE Foundation, Inc. (The Foundation)**, located in Dekalb County Georgia, on behalf of and for the benefit of the American Society for Heating, Refrigerating & Air Conditioning Engineers (ASHRAE). In accordance with the Foundation's tax-exempt status, the gift will be placed in endowment and used for the stated purpose.

1. **Pledge**

The Donor, in consideration of an abiding interest in ASHRAE and for support of the Society, pledges to ASHRAE Foundation the amount of \$60,000 US Dollars (Total Gift) subject to the provisions below to be paid via multi-year installments as follows: The Total Gift will be paid to the ASHRAE Foundation in a period of five years, with the first installment of \$12,000 US Dollars to be paid on or by June 30, 2022. Future installments will be paid annually to fulfill this pledge until it is complete according to the following payment schedule:

\$12,000 by June 30, 2023;

\$12,000 by June 30, 2024;

\$12,000 by June 30, 2025;

\$12,000 by June 30, 2026;

Donor understands that the first scholarship under this agreement may not be awarded until at least one year following receipt of the Total Gift. In the event that the pledge for the Total Gift is not fulfilled according to the schedule set forth above, then this Agreement may be terminated and the fund balance and any unspent earnings may be transferred to an undesignated fund and used for a purpose as closely related to the original purpose as possible, keeping in mind the original intent of the Donor.

The Foundation will hold the Total Gift together with any other properties that may later be brought within the operation of this Agreement, for the purposes described in this Agreement.

The Foundation and Donor agree that the Donor and others have the right to make additional donations, either by gift or bequest, to be added to the Donor's Total Gift at the Foundation for the purposes outlined by this Agreement. Any such additional donations shall not in any way alter the purposes outlined in Section (2) below.

2. **Purpose**

The Toronto Chapter Scholarship Endowed Fund is to encourage local university and college students to pursue studies that will qualify them for employment in the heating, refrigeration and air conditioning industry.

Applications will only be accepted from students attending a college or university in the Greater Toronto Area which has an active ASHRAE Student Branch or the school is accredited by Engineers Canada, a signatory of the Washington Accord or the Canadian Council of Technicians and Technologists (CCTT), a signatory of the Sydney Accord.

Qualified applicants must be full-time undergraduate mechanical, architectural, sustainability, or building science engineering or engineering technology students enrolled in a program leading to a professional degree or advance diploma in a field of study that has traditionally been a preparatory curriculum for the HVAC&R profession. Applicants must have a class standing of no less than the top 30% ~~and meet at least one of the following criteria.~~

Applications and all supporting documents must be in English.

If there are no qualified applicants available the scholarship would not be awarded for that year, and the funds will be available the following year to award two scholarships.

The Donor agrees to follow the ASHRAE "Scholarship Program Guidelines" in selection of the scholarship recipient, approved by the ASHRAE Board of Trustees as of June 29, 2011 and revisions to those guidelines as may be made in the future. The Donor should be advised of any proposed changes to these guidelines to allow the chapter to provide their input on proposed changes.

Pursuant to ASHRAE Foundation's spending policy for each fiscal year, as determined by the ASHRAE Foundation Trustees after considering the factors described in the Official Code of Georgia Section 44-15-4(a), 1-7, the applicable earnings portion of the Fund each year shall be used to support a deserving Engineering undergraduate student through the award of a scholarship. This amount is determined upon approval of the Foundation Trustees. As of the date of this agreement, the Foundation's spending policy is 5% of the Donor's Total Gift in American dollars.

3. Administration

The Foundation will manage the Fund in accordance with its financial management policies by the Board of the Foundation and use the Total Gift only to support the purpose outlined in Section (2). The ASHRAE Society Scholarship Trustees will select the scholarship recipient annually.

4. Changed Circumstances


It may be that at some future time it becomes impossible or impracticable, as decided by the Board of the Foundation, for all or part of the Toronto Chapter Scholarship to be used for the specific purpose set

forth above. The Board of the Foundation shall direct that its principal and income be devoted to purposes that it deems to be most consistent with the wishes and intentions of the Donor.

5. Recognition

Donor here agrees that the Total Gift may be noted in future ASHRAE Foundation and ASHRAE Society publications.

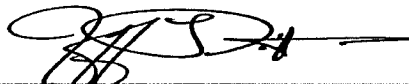
In witness whereof, the Donor and the Foundation have executed this Agreement on the dates indicated below.



Mr. Abhishek Kharana
Toronto Chapter of ASHRAE
Chapter President

June 26, 2022


Date



Mr. Jeff Littleton, Secretary
ASHRAE Foundation, Inc.

07/06/2022

Date



Mr. Tom Watson, Foundation Chair 2021-22

07/06/2022

Date

Appendix A

Certificate of Compliance

On June 26, 2016 the ASHRAE Foundation and the Toronto Chapter of ASHRAE entered into an agreement governing a scholarship established by the Canadian Chapter. The Chapter transferred an initial gift to the Foundation. The Foundation agreed to invest the Chapter's scholarship funds in the Foundation's endowment for the benefit of the Chapter. The Chapter agreed to notify the Foundation each year of the name or names of the scholarship recipient.

The Chapter hereby certifies that it is in compliance with the ASHRAE Scholarship Program Guidelines in effect as of the date of this certificate. Among these requirements is Section 3.3 requiring a non-discriminatory selection process by the Toronto Chapter. Section 3.3 states, among other things, that the selection criteria are reasonably related to the scholarship purpose and that the scholarship may not be used to benefit an ASHRAE member, to recruit employees or to induce employees to continue their employment. A complete copy of the current Scholarship Program Guidelines are available on request from the Foundation.

Abhishek Khurana

Name

Toronto Chapter of ASHRAE President

June 26, 2022

Date



Task Force for Building Decarbonization Update

10/7/22

ASHRAE's position...

Eliminating GHG emissions from the built environment is essential to address climate change



Our goals...

2030

the global built environment must halve its 2015 GHG emissions

- All new buildings must be NZE
- Widespread EE retrofits of existing assets
- New construction embodied carbon must be reduced by at least 40%

2050

all new and existing assets must be net zero GHG emissions across the whole life cycle



Our energy efficiency history...

1975

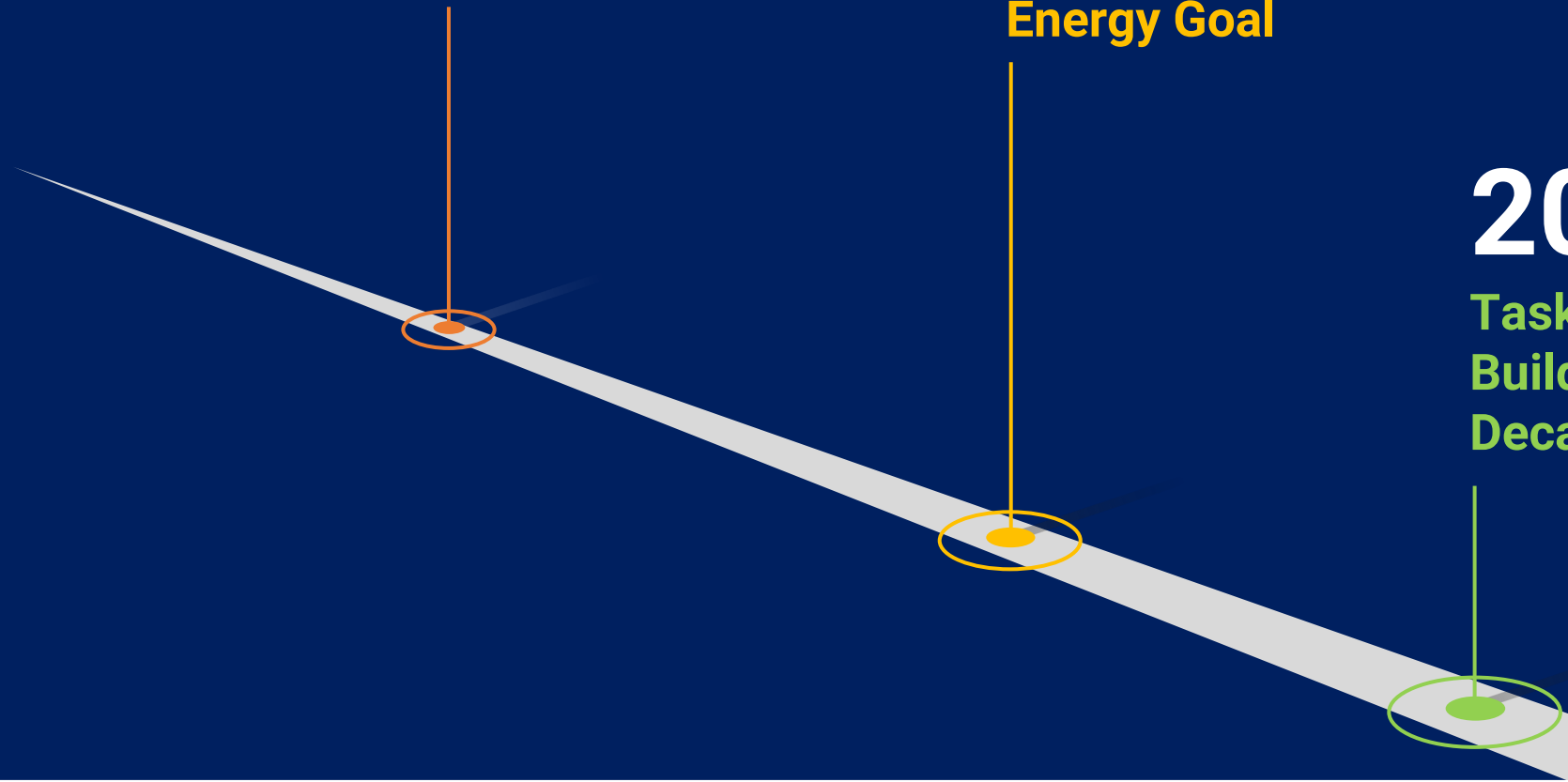
ASHRAE
Standard 90

2007

2030 Net Zero
Energy Goal

2021

Task Force for
Building
Decarbonization



ASHRAE key commitments...

- Develop technical guidance, standards, training, and other tools to support building decarbonization policy goals
- Educate and train the future workforce for building decarbonization
- Promote whole-building life-cycle assessment (WBLCA)
- Strengthen ASHRAE standards every 3-5 years, consistent with achieving a fully decarbonized built environment by 2050



BOARD OF DIRECTORS

TASK FORCE FOR BUILDING DECARBONIZATION

ExCom

Develop and implement strategy
Internal and external coordination
Prioritize member and industry needs

Global
Advisory Panel

ASHRAE
Bodies

Operational
Subcommittee

Products & Services
Subcommittee

Operational
Working Groups

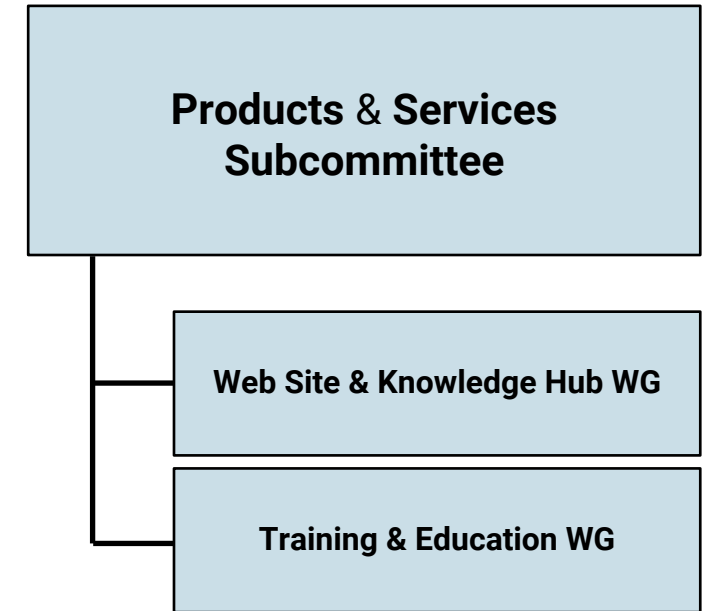
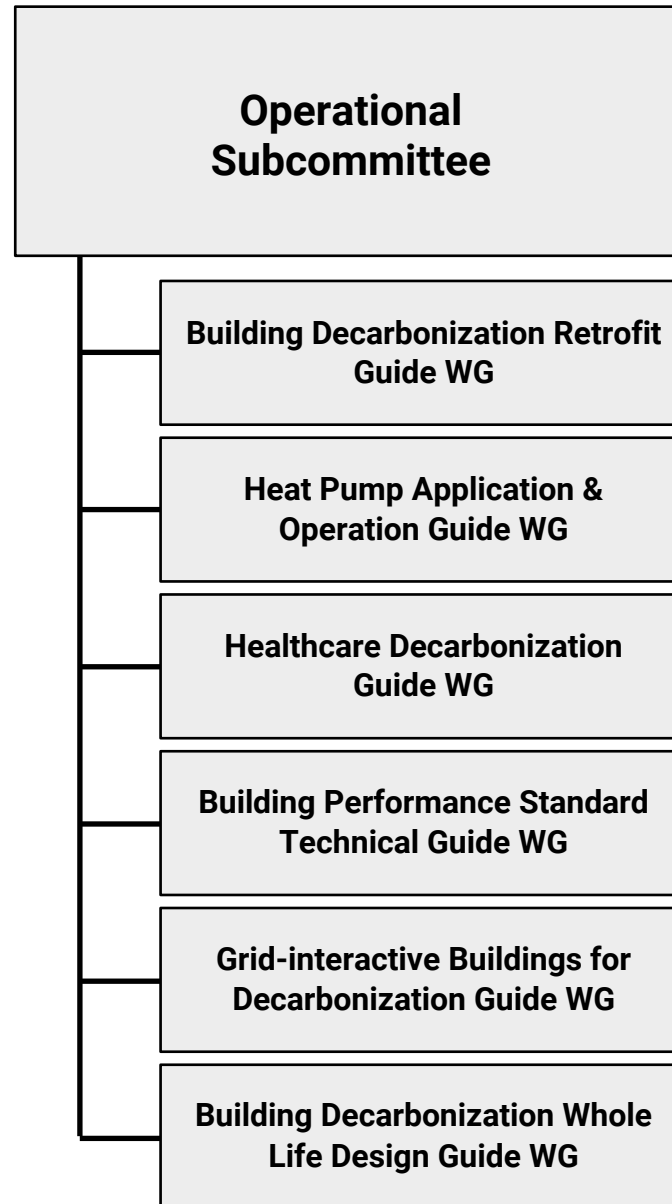
Products & Services
Working Groups

TC Liaisons



**TFBD
ExCom**

**TASK FORCE FOR
BUILDING
DECARBONIZATION**
2022-23



TFBD Liaisons

Number	Title	All WGs	TExCom	P&S SubC	Chair, VC	Retrofit	Heat Pump	Healthcare	BPS	GIB	Whole Life
ASHRAE Technical Committees											
1.04	Control Theory and Application	X				X	X				
1.05	Computer Applications	X					X				
1.06	Terminology	X									X
1.09	Electric Systems	X								X	
1.10	Combined Heat and Power Systems	X	X		X						
2.05	Global Climate Change	X			X				X	X	X
2.08	Building Environmental Impacts and Sustainability	X	X	X		X				X	X
2.10	Resilience and Security	X		X	X	X					X
3.01	Refrigerants and Secondary Coolants						Requested				Requested
3.08	Refrigerant Containment	X									X
4.02	Climatic Information	X	X	X							
4.04	Building Materials and Building Envelope Performance	X				X					
4.05	Fenestration					Requested					
4.07	Energy Calculations	X		X	X	X					
6.02	District Energy	X	X	X	X						X
6.07	Solar and Other Renewable Energies	X		X							
6.08	Geothermal Heat Pump and Energy Recovery Applications	X					X			X	
6.09	Thermal Storage	X	X		X						
6.10	Fuels and Combustion	X				X					
7.01	Integrated Building Design	X		X							
7.03	Operation, Maintenance and Cost Management	X				X					
7.04	Exergy Analysis for Sustainable Buildings	X				X					
7.05	Smart Building Systems (orig. TC 4.11 & TC 7.4)	X				X	X			X	
7.06	Building Energy Performance	X	X			X			X	X	
7.09	Building Commissioning	X			X	X		X	X		
8.11	Unitary and Room Air Conditioners and Heat Pumps (orig. TC 7.6)	X					X				
9.06	Healthcare Facilities	X						X	X		
9.12	Tall Buildings	X	X								
10.01	Industrial Refrigeration and Piping Systems						Requested				
ASHRAE Multidisciplinary Task Groups											
	MTG.BIM Building Information Modeling	X		X							
	MTG.LowGWP Lower Global Warming Potential Alternative Refrigerants	X									X



STANDARDS

EDUCATION

**KNOWLEDGE
RESOURCE
HUB**

**TECHNICAL
TOOLS**

**POSITION
DOCUMENT**

**Four
Key
Focus
Areas**



Technical Resource Guides

- Building Decarbonization Retrofits
- Heat Pump Application and Operation
- Building Performance Standards
- Decarbonization Whole Life Design Guide for MEP Systems
- Hospital Decarbonization Design Guide
- Grid Interactive Buildings for Decarbonization: Design and Operation

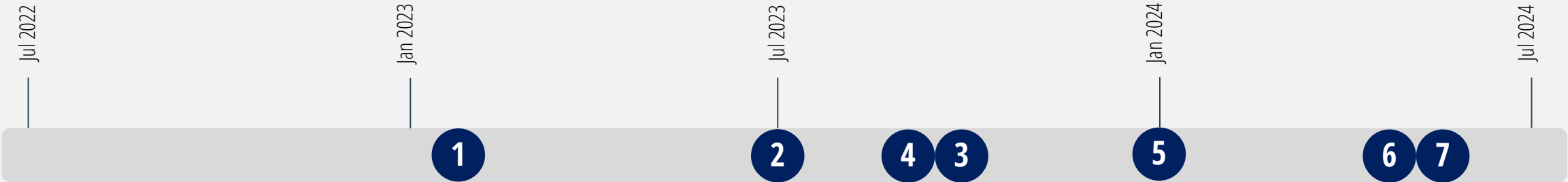
Technical Resource Guide Status

Working Group Developed Guides

	Summary	Draft WS	Final WS	60% Draft	90% Draft	To Pubs	Complete
1 BPS Technical Resource	Complete	NA	NA	Complete	Oct-22	Nov-22	Feb-23
2 TM65 for North America	Complete	Oct-22	Nov-22	Feb-23	Apr-23	May-23	Jul-23 Target Jun-23
3 Decarb Whole Life Design Guide for MEP Systems	Complete	Oct-22	Nov-22	Apr-23	Jun-23	Aug-23	Oct-23

Contractor Developed Guides

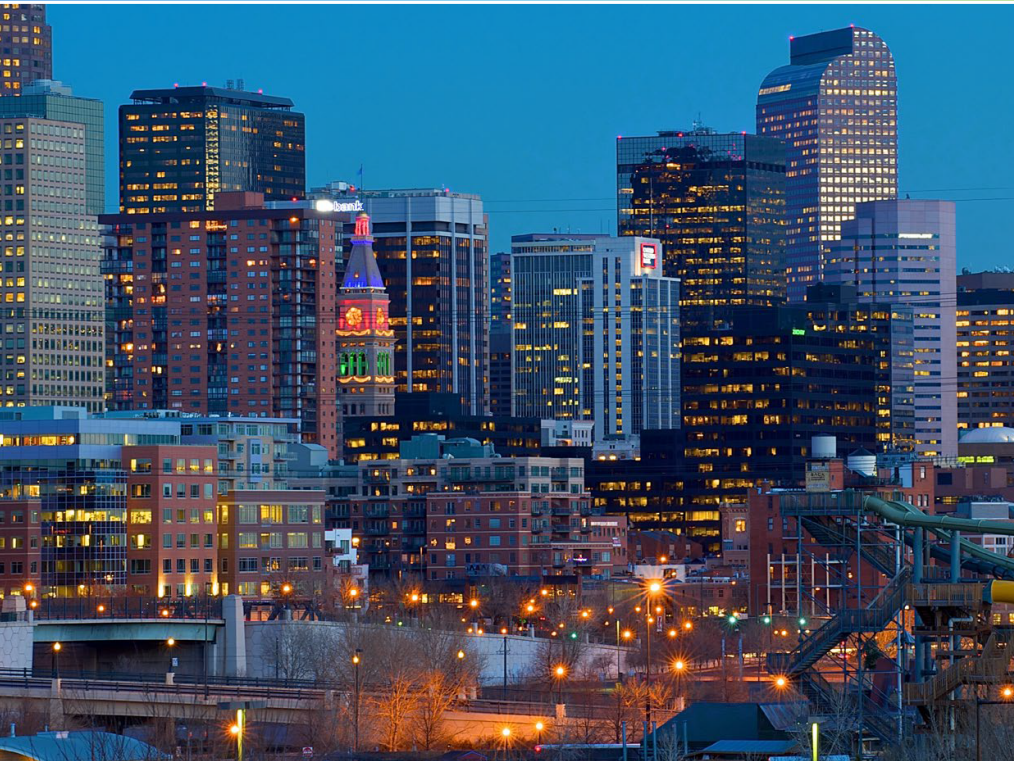
	Summary	Draft WS	Final WS	RFP	Bids Due	Selection	Award	60% Draft	90% Draft	To Pubs	Complete
4 Grid Interactive Buildings for Decarbonization	Complete	Complete	Complete	Complete	Complete	Complete	Oct-22	Jan-23	Apr-23	May-23	Aug-23
5 Healthcare Decarbonization	Complete	Oct-22	Nov-22	Nov-22	Dec-22	Jan-23	Feb-23	Jun-23	Aug-23	Oct-23	Jan-24
6 Building Decarbonization Retrofit	Complete	Oct-22	Nov-22	Nov-22	Dec-22	Jan-23	Feb-23	Aug-23	Nov-23	Jan-24	Apr-24
7 Heat Pump Application & Operation	Complete	Oct-22	Nov-22	Nov-22	Jan-23	Feb-23	Mar-23	Sep-23	Dec-23	Feb-24	May-24





Building Decarbonization Retrofit

Technical Resource Guide



Objective: To provide design engineers with a framework for decarbonizing existing commercial and multi-family buildings, along with specific solutions, guidance, and case studies for these two building sectors.

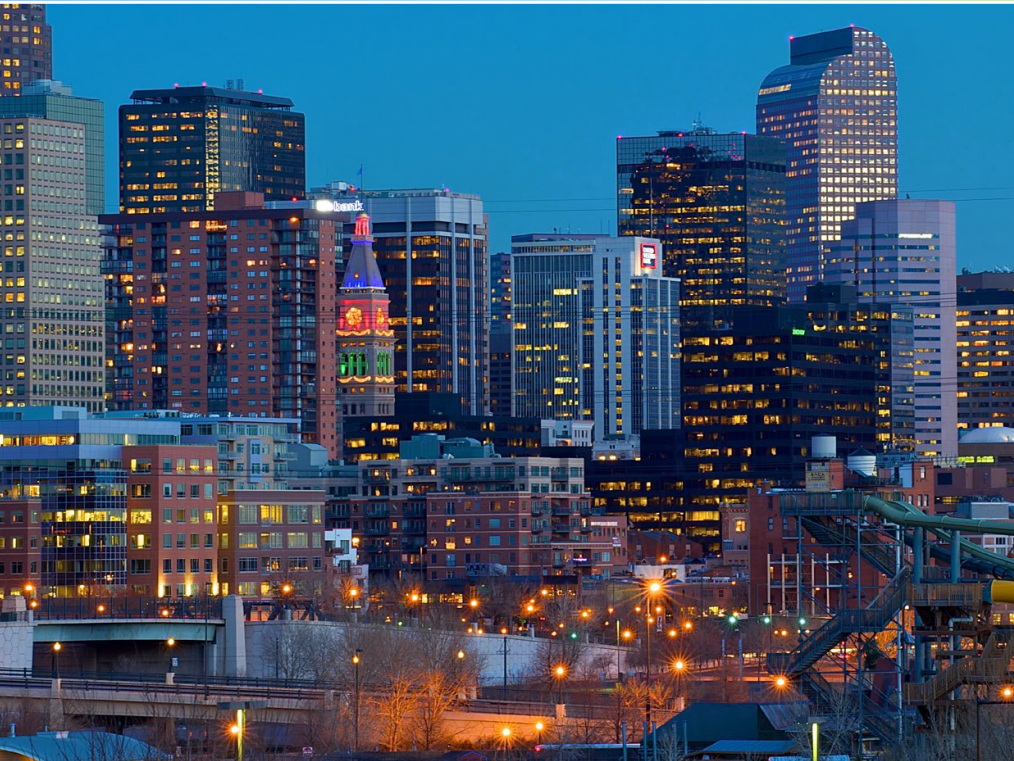
Background: Countries, states, cities and private industry are all setting decarbonization goals expressed in terms of a percent reduction in carbon emissions by a certain date. Even at the seemingly far off date of 2040, two-thirds of the global building stock at that time will be buildings that exist today . Decarbonization of the existing building stock is thus essential in the effort to meet any decarbonization goal. Much of the initial attention on decarbonizing buildings has been focused on new construction, where challenges and constraints are typically fewer, and codes are more easily applied. While many of the principles of decarbonization apply to both new construction and existing buildings, existing buildings present unique challenges and considerations that require a different solution framework.

Target audience: Design engineers



Heat Pump Application & Operation

Technical Resource Guide



Objective: To develop a guide on the techniques and practices needed to incorporate various types of heat pump technologies in buildings in multiple climates for the purposes of decarbonization.

Background: Widespread deployment of heat pumps is expected to be a key strategy in on-going efforts to decarbonize building heating and hot water loads. Proper application, design, and operation of heat pump systems will be critical to the success of this effort.

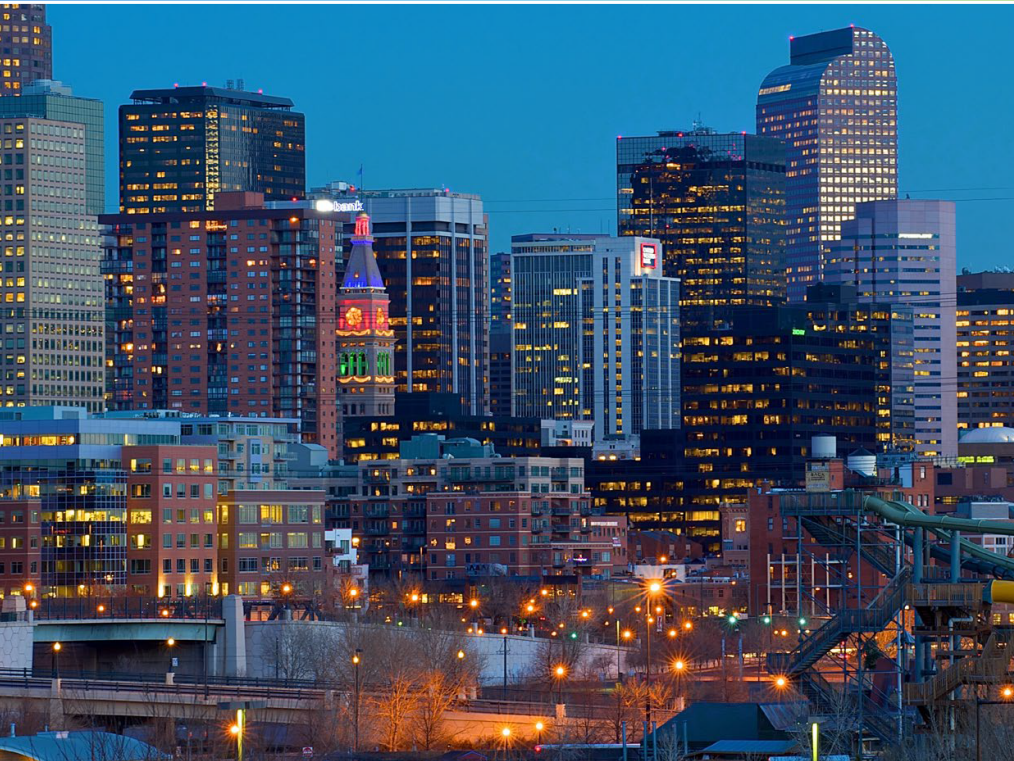
The Heat Pump Application and Operation Guide will focus on how heat pumps should be applied and how they should be operated in commercial and multi-family buildings to support decarbonization. The guide will provide guidance to design engineers on various heat pump-specific design elements including application and sizing in different climate zones, system configuration and refrigerants, electrical requirements, and control and operation strategies for space and hot water applications. The Heat Pump Application and Operation Guide will represent a critical resource to building designers and operators to support widespread adoption of this building decarbonization strategy.

Target audience: Design engineers, building operators



Building Performance Standards

Technical Resource Guide



Objective: Provide technical support for the Building Performance Standards development and implementation.

Background: This Guide is intended to provide technical basis and resources to policymakers, building owners, facility managers, design professionals and ASHRAE members when developing and implementing a Building Performance Standard. The Guide focuses on North America, where BPS are in place in several states and cities.

The Guide focuses on building types and scope of BPS as developed by leading U.S. cities and states. The guide covers BPS aimed toward reducing building operating energy use and resulting emissions and does not cover embodied energy or carbon. An ASHRAE Building Decarbonization Whole Life Design Guide is currently in preparation that will address embodied energy and carbon.

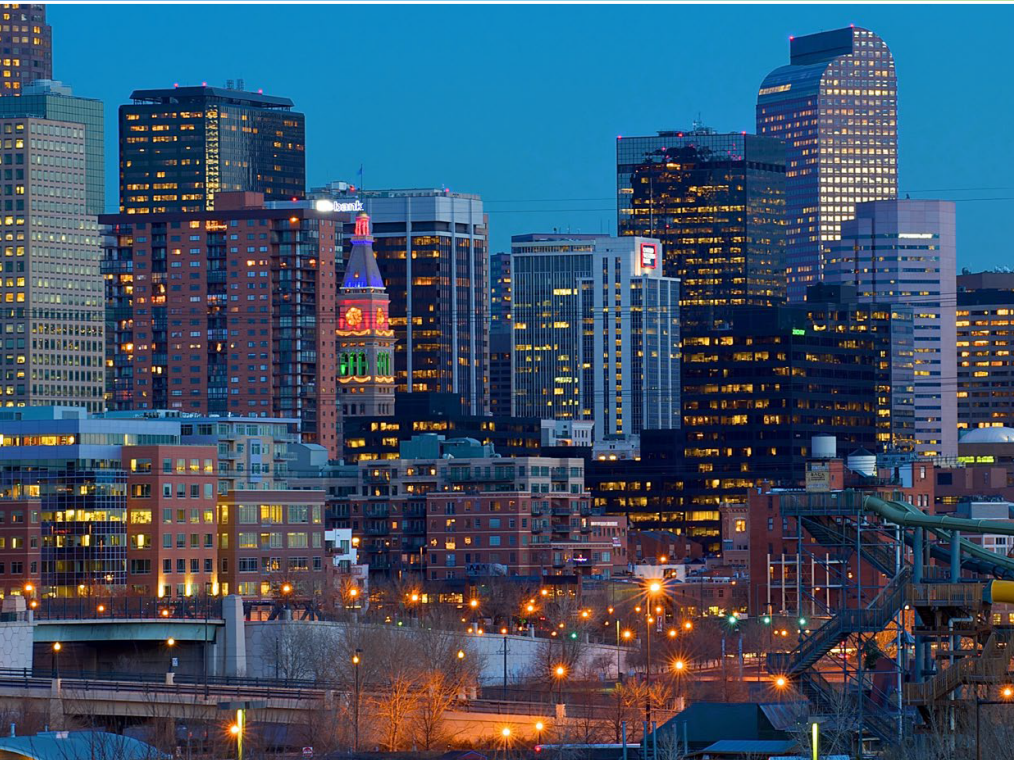
The Guide focuses on larger buildings, generally in the Scope of ASHRAE's Standards that cover buildings other than low-rise residential buildings (e.g., ANSI/ASHRAE/IES Standard 90.1: Energy Standard for Buildings Except Low-Rise Residential Buildings). It is possible that a future ASHRAE Guide may address BPS aimed at small residential buildings.

Target audience: Policymakers, building owners, ASHRAE members and design professionals



Decarbonization Whole Life Design Guide for MEP Systems

Technical Resource Guide



Objective: Provide a design guide to minimize the whole life carbon emissions from MEP systems

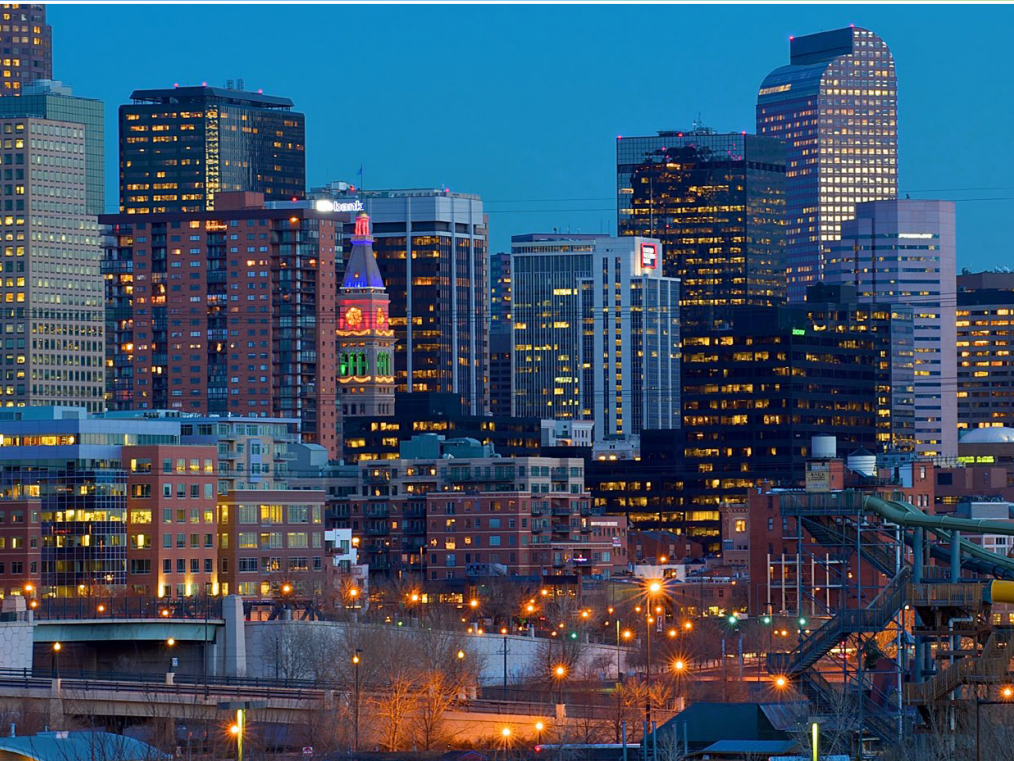
Background: Mechanical, electrical, and plumbing (MEP) systems are major contributors to the operational energy consumption and whole life carbon emissions of buildings. The industry has information and design methods to minimize the operational energy consumption and greenhouse gas emissions from heating, ventilation, and air conditioning (HVAC) and refrigeration systems; however, there are limited data and design guidance available to quantify and minimize the whole life emissions associated with the building MEP systems. Recent studies have shown that the embodied emissions from MEP systems can be between 15% and 49% of the total building embodied emissions and even higher if photovoltaic (PV) systems are included on the building. In order to minimize the whole life carbon emissions of MEP systems, tradeoffs between the embodied carbon and the operational carbon emissions, and among MEP, architectural and structural systems emissions should be considered. This guide will provide ASHRAE members and others with the definitions, concepts, and comprehensive guidance needed to calculate, interpret, and integrate life cycle data from multiple sources to design MEP systems for low whole life carbon emissions.

Target audience: Design engineers



Hospital Decarbonization Design Guide

Technical Resource Guide



Objective: Provide a design guide to specifically show how to reduce GHG emissions in hospital buildings.

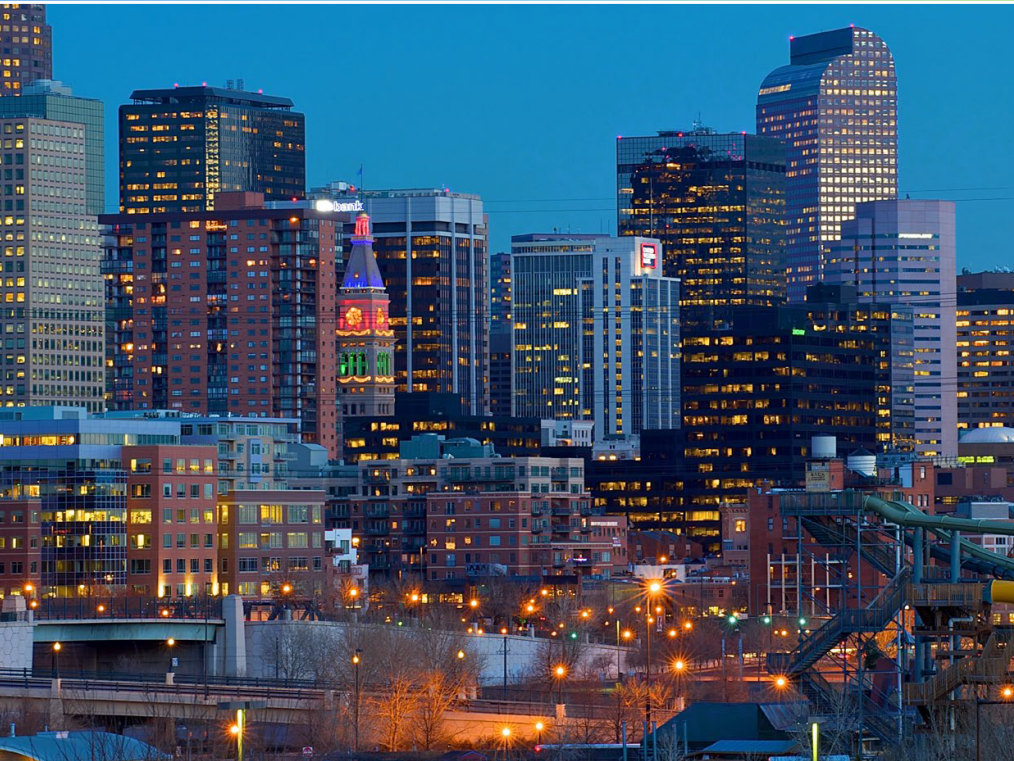
Background: North America hospital buildings have one of the largest carbon use intensities (CUI) of all building types. Owners of these buildings have a high interest in contributing to population (public) health by first, doing no harm. Some jurisdictions are now requiring all-electric new buildings. Yet the challenges for decarbonizing healthcare buildings are much more complex than those for other buildings because of their unique needs in terms of the number and complexity of systems, infection prevention needs, regulatory environment, abundance of technology to deliver healthcare services, and needs for resilience. Thus, special guidance for these buildings is critically needed. The Decarbonization Design guide for Hospitals will fill the need for hospitals but will also provide insight for other building types.

Target audience: Hospital facility managers, capital planners, hospital architectural and engineering teams, sustainability leaders, contractors and other building stakeholders.



Grid Interactive Buildings for Decarbonization

Design and Operation Resource Guide



Objective: To develop a guide on the techniques and practices needed to enable buildings to maximize the benefits from the grid while minimizing carbon impact of the grid and building.

Background: This guide builds on the existing ASHRAE Smart Grid Application Guide by providing specific design and operational parameters for building projects (in the vein of an AEDG) that allow the audience to maximize carbon reduction in their interaction with the grid. Grid-interactivity is still a relatively new practice for most members of this audience.

This guide would have decarbonization as the primary goal. The guide will provide guidance on controls as they shift toward more real-time, automated interaction with the grid.

This guide could directly inform (and be referenced by) other global standards and initiatives, including general sustainability and climate standards (such as those administered by ASHRAE, ISO, Green Building Councils, and others) as well as those that are more focused on comprehensive grid interactivity.

Target audience: Building operators, designers, owners, consultants, and other building stakeholders



Standards

- 240P new whole life carbon standard with ICC intended for code adoption
- 211 will be updated for building decarbonization audits
- 100 will become building performance standard for existing buildings
- 90.1 future direction is critical
- 90.2 being revised as energy and carbon reach code



Education

- Decarbonization courses (3-hour)
 - ✓ Fundamentals
 - ✓ Systems and Equipment
 - ✓ Applications
- Heat Pump Application and Operations (full-day)
- Building Decarbonization Retrofits (full-day)
- Building Decarbonization Audit (full-day)
- Building Decarbonization 101 (45-minutes)

Collaboration



WHERE
THE FUTURE
IS BUILT



Building Industry Decarbonization Collaborative



- Proposed U.S. building industry collaborative initiated by ASHRAE
- National partnership of building industry organizations, coordinating and supporting the engagement of their chapter members in helping public and private building owners at a local level turn climate ambition into decarbonization action, at speed and scale
- Primary focus will be on educating the public and private sector on the technical “nuts and bolts” of building decarbonization, rather than policy design and implementation
- Potential announcement at 2023 ASHRAE Winter Conference

Future Activities (Nov-Jan)

- Decarbonization web site and social media
- Provide a comprehensive plan for integrating building decarbonization activities into the ASHRAE structure
- Coordinate with and assist the Planning Committee to incorporate ASHRAE's building decarbonization goals into the Society strategic plan





ASHRAE is committed to develop the technical guidance, standards, training, and other tools to support building decarbonization policy goals

10. Technology Council recommends that proposed changes to the Procedures for ASHRAE Standards Actions (PASA) within Section 4. Approval Of Proposed Standards, Section 5. Relationships with other Standards-Developing Organizations, Section 7. Criteria for Approval, Withdrawal, and Discontinuance of ASHRAE Standards and Guidelines, Annex A1: Definitions, Annex B: Appeals of Board of Directors' Standards Actions or Inactions, and Annex C: Complaints of Actions or Inactions by the StdC, its Subcommittees or PCs, be approved as shown:

4.1 RESPONSIBILITY

The Standards Committee is responsible for the formation of project committees and the development, preparation, interpretation, revision, reaffirmation, and withdrawal ~~—and submittal to the Board of Directors or its designee for approval—~~ of ASHRAE Standards Actions for Standards, and ~~for~~ Guidelines, except as noted. The Board of Directors or its designee will counsel and offer guidance to the Standards Committee on ~~policy level Standards~~ contentious issues during the development of the standards or guidelines.

4.3.1 Project Committees

Project committees are authorized by the Standards Committee as either Standard Project Committees (SPCs), which are ad hoc committees, or Standing Standard Project Committees (SSPCs), Guideline Project Committee (GPC), or Standing Guideline Project Committee (SGPC). Project committees are the consensus bodies of the Society. If a standard project committee is not balanced, efforts to recruit materially affected and interested parties from diverse interest categories to become members of a non-balanced SPC shall be on-going and documented.

A member of the SPLS is appointed as StdC Liaison to the new project committee. A call-for-members announcement is conducted. Drawing from the resulting applications and recruiting efforts, candidate committee members are recommended in consideration of their personal expertise and their effect on committee balance. Recommended members and ~~non-policy level~~ PC Chairs are approved by a majority vote of ~~a designated subcommittee of Standards Committee, normally~~ SPLS. ~~Standards Committee must concur by majority vote for all policy level PC Chairs.~~

4.3.3 PC Activity Initiation

At the first official meeting of a new PC, the PC shall vote on whether to concur with, or propose changes to, the original Title, Purpose and Scope (TPS). The PC may conduct business (for example, pass motions) only after the balanced membership roster with at least 5 voting members has been approved by SPLS or the StdC. However, the PC Chair may hold organizational meetings for individuals interested in becoming members of the PC, and the group may begin developing the Standard or Guideline.

4.3.4 Use of Subcommittees

The PC Chair may organize the committee structure using formal subcommittees. If subcommittees are used, the Chair's recommendation for subcommittee Chair must be approved by SPLS. Responsibilities of various PC subcommittees typically are to develop drafts of one or more assigned clauses of a standard, annexes, or addenda; prepare a system of units; prepare text in appropriate language; establish educational activities; develop draft responses to requests for interpretation; or develop proposed responses to comments resulting from public review. Subcommittees may also be formed to draft Standards Committee-approved standards or guidelines related to the subject matter of the parent project committee. Subcommittee actions shall be submitted as recommendations for action by the parent PC.

4.3.6 PC Members

A PC shall have individual members and designated PCs may have organizational members (see section 4.3.10). Individual members are appointed as "personal members," not as representatives of any organization, corporation, partnership, or employer. There shall not be more than one PCVM from any one company, association, or agency, or entity.

4.3.8 Removal for Cause

The PC Chair may recommend removal of a PC member from the roster for due cause, by submitting a recommendation and justification outlining the reasons for said recommendation. ~~and~~ The PC Chair must submit a copy of communications between the PC Chair and PC member concerning this subject with the recommendation, in writing to the SPLS Liaison and Manager of Standards (MOS). The MOS will transmit the recommendations of the PC Chair and SPLS Liaison and related correspondence to SPLS for action in a meeting or by letter ballot. The SPLS Chair may call an executive session of the SPLS or the PC to discuss the matter. Failure of the PC member to properly disclose any conflict of interest shall be grounds for removal from the PC by SPLS.

4.3.12 Project Committee Size

The PC shall be balanced and consist of no less than 5 PCVMs with no upper limit, including the Chair. In addition to the PCVMs, the PC membership may also include PSVMs if the PC is organized into subcommittees or NVMs if not organized into subcommittees.

5.2 Joint Sponsorship

A request to jointly sponsor a standard shall be evaluated by the Standards Committee, considering overlap of expertise and responsibility. The evaluation must be reported to Technology Council. A recommendation for joint sponsorship including a recommendation for the lead organization shall be forwarded to the Technology Council for approval and reported as an information item to the Board of Directors. A recommendation against joint sponsorship shall be forwarded as an information item to Technology Council and the Board of Directors.

If joint sponsorship is approved by ~~the Board of Directors~~Technology Council, standards-writing and approval procedures must be negotiated with the other organization by the MOS on behalf of the Standards Committee. The standards-writing and approval procedures should be those of the lead organization. If ASHRAE procedures are not adopted, the adopted procedures must be compatible with ASHRAE procedures in regard to openness of proceedings, public review of drafts, and delegation of technical content to the project committee.

7.2.1.1 Advisory Public Review (APR)

A PC may vote by majority of the voting membership to recommend to the SPLS Liaison ~~and SPLS Chair~~ that a draft standard, guideline, or portion thereof, be subjected to an APR if the PC believes that the draft contains new, unusual or potentially controversial elements that the PC believes would benefit from increased public scrutiny prior to finalizing the draft for publication public review (no continuation letter ballot, no roll call vote record, no marked up roster, or submittal form is needed). Any comments received as a result of an APR are deemed to be "supportive" and do not need to be "resolved". Apart from acknowledging receipt of each comment, communication with commenters is optional but may be undertaken to clarify a comment's intent or to invite further participation in the standard development process. The underlying concept of the APR is to gain increased public participation early in the development process and thus to deal with, and potentially resolve, controversy before publication approval is sought. APRs are not submitted through the ANSI process.

7.2.1.3 Fast Track Public Review (FTPR)

A standards action approved by the PC for publication public review that meet all of the following criteria shall be processed as a fast track:

- a) there are no negative votes with reason within the PC;
- b) there is no credible threat of legal action (in writing) against ASHRAE has been made related to the proposed draft; and
- c) the SPLS Liaison has not notified the MOS within ten calendar days, from the receipt of the package, with specific justification, that the PC has violated due process.

No additional approvals for issuing the standard, guideline or portion thereof, for public review are required.

7.2.2 Publication Approval

Approval of Standards Action by the ~~ASHRAE Board of Directors~~Standards Committee that have unresolved objectors ~~or a threat of legal action~~ shall be preceded by formally voted recommendations by the project committee ~~and Standards Committee~~. Standards Actions with unresolved objectors shall be reported to Technology Council and the ASHRAE Board of

Directors. The ASHRAE Board of Directors shall approve Standards Actions that have unresolved objectors with a credible threat of legal action.

Approval of Standards Actions that have no unresolved objectors and no threat of legal action shall be preceded by formally voted recommendations by the project committee and processed for publication by ASHRAE Staff. These Standards Actions shall be reported as an information item to the Standards Committee, Technology Council and the ASHRAE Board of Directors.

The standard, guideline or portion thereof, shall be deemed to have been approved by the BOD Standards Committee upon approval of its designee.

7.2.3 Quorum Requirements

To conduct standards-related business at a meeting of a project committee, StdC or its subcommittees, Technology Council or the Board of Directors, a quorum must be present. A quorum exists if a majority of the voting membership is present.

7.2.4.2 Numerical Requirements for Standards Action Votes

Standards actions votes must be approved by the project committee with ~~(1)~~ affirmative recorded votes by the majority of the total voting membership of the project committee, whether present or not, excluding abstentions. ~~of the project committee, and (2) affirmative votes from at least two-thirds of those voting, excluding abstentions of the project committee.~~

7.2.4.6 Approval of Standards Actions by Approval Bodies

When recommendations for standards action votes are considered by SPLS or, Standards Committee ~~and the Board of Directors~~, the recommendation must be approved by a majority of those voting at a meeting, or by letter ballot.

7.2.5 Voting Rules for Meetings

Actions of PCs and PC subcommittees require approval by a majority of those voting at a meeting. Standards action votes must comply with 7.2.4. Issuance of an official interpretation requires affirmative votes of the majority of the voting membership and of at least two-thirds of those voting, excluding abstentions.

7.2.6.1 Numerical requirements for letter ballots

Actions of the PC and subcommittees ~~that are not standards action votes~~, conducted by letter ballot, require approval by a majority of the voting membership of the committee. Standards action votes must comply with 7.2.4.2. The issuance or revision of an official interpretation require affirmative votes of the majority of the membership and of at least two-thirds of those voting, excluding abstentions.

7.4.4.2 Complaints of Inactions by the Standards Committee, its Subcommittees or Project Committees

In addition to formal appeal of Board Standards Committee standards actions or inactions, failure of the Standards Committee, its subcommittee(s), or a Project Committee to consider a written request may be addressed by writing (including electronic communication) to the Manager of Standards at any time. (See [Annex C](#).)

7.4.5 Public Review Period

The public review comment period shall normally be the minimum allowed by ANSI unless more time is justified. Limited revisions, such as Independent Substantive Changes (ISCs) and addenda up to 5 pages may have a 30-day comment period.

7.4.6.2 Comments Received Under Continuous Maintenance

An SSPC or SGPC that is designated by the Standards Committee as operating under continuous maintenance procedures shall take documented, consensus action on each request for change to any part of its standard or guideline.

7.4.7 Consideration of Standards Proposals

Prompt consideration shall be given by the Standards Committee to proposals made for developing new standards or guidelines or revising, reaffirming, or withdrawing existing standards and guidelines.

7.7.3 Other Bases for Withdrawal of Approval - updated

The ~~ASHRAE Board of Directors~~Standards Committee or its designee also may withdraw approval of an ASHRAE Standard, Guideline or portion thereof, upon (a) advice of counsel, based on evidence of a legal nature, or (b) consideration of facts that have subsequently come to the attention of ~~the Board~~ the Standards Committee.

7.8.1 Project Discontinuation Due to Lack of Membership

Project discontinuation due to lack of membership shall be based on the following:

- a) A new project shall be discontinued by the MOS if a PC Chair and balanced membership have not been approved by SPLS within twelve months after the project is approved by the ~~Board of Directors~~Standards Committee.

7.11 Interpretation Requests of Standards

Interpretation requests for a standard must be submitted to the MOS in writing. The Manager of Technical Services or the Chair of the current or past cognizant PC or the Chair's designee may respond in writing to written requests for unofficial personal interpretations. Cognizant SSPCs, if they exist, and SPCs that have not yet been disbanded will be asked to respond to requests for official interpretations in writing. If no PC exists, StdC will form an Interpretations Committee (IC) to respond. Procedures for interpretations of published Standards, Guidelines or portion thereof, are provided in StdC MOP Reference Manual Section 10. An issuance or revision of an official interpretation requires affirmative votes for the majority of the memberships of each approving and of at least two-thirds of those voting, excluding abstentions.

7.12 Interpretation Requests of ASHRAE Standards Development Procedures

Interpretations requests for ASHRAE's standards development procedures must be submitted to the MOS in writing. ASHRAE Staff may respond in writing to written requests for unofficial personal interpretations. Requests for official interpretations of procedures shall be submitted to PPIS. An issuance of an official interpretation requires affirmative votes for the majority of the memberships of PPIS and of at least two-thirds of those voting, excluding abstentions.

A1 DEFINITIONS:

normal track: an approval procedure applied to a Standard, Guideline or portion thereof, that meets one or more of these criteria:

- a) receives one or more negative votes with reason upon approval for publication or
- b) where ASHRAE receives a written legal threat

~~**policy level document:** a standard, guideline, designated as "policy level" by the Board of Directors or the Board's designee.~~

subcommittee: a group of individuals appointed by the project committee chair from among the project committee membership who vote on subcommittee activities and whose responsibility it is to develop drafts of one or more assigned sections of a standard, annexes, or addenda;

develop draft responses to requests for interpretation; or develop proposed responses to comments resulting from public review; all submitted as recommendations for action by the parent project committee. Subcommittees may also be formed to draft Standards Committee approved standards or guidelines related to the subject matter of the parent project committee.

ANNEX B: APPEALS OF ~~BOARD OF DIRECTORS'~~STANDARDS COMMITTEE STANDARDS ACTIONS OR INACTIONS

B2 APPEALABLE MATTERS

An action or inaction of the ~~Board of Directors (BOD)~~Standards Committee to adopt a new ASHRAE Standard, Guideline, an addendum to an existing Standard or Guideline, or to revise, reaffirm, or withdraw an existing ASHRAE Standard or Guideline is subject to appeal.

B3 WHO MAY APPEAL

Any person directly and materially interested who has been or will be adversely affected by the publication of a new, revision, reaffirmation, or withdrawal of an ASHRAE Standard, Guideline or portion thereof, or lack of such action, may appeal the ~~BOD~~ Standards Committee action or inaction. The appellant must be an unresolved public review commenter, associated with a new, revision, reaffirmation or withdrawal of the ASHRAE Standard or Guideline being appealed, or a PC member who cast a negative vote with reason(s) in relation to his/her vote on the consensus body associated with the creation, revision, reaffirmation or withdrawal of the ASHRAE Standard or Guideline being appealed.

B4 SCOPE OF APPEAL AND BURDEN OF PROOF

An appeal of a ~~BOD~~ Standards Committee standards action or inaction shall be solely based upon procedural grounds. When appeals are filed, the appellant shall demonstrate that ASHRAE Standards development procedures were not followed. Appeals arguments that are based on actions that took place in previous revision cycles will not be considered.

B6 NOTIFICATION PROCEDURES

Within 15 working days following ~~BOD~~ Standards Committee action on a standard, that results in approval of a new, revision, reaffirmation or withdrawal of a standard or addenda to a standard, the Manager of Standards (MOS) shall notify in writing (including electronic communication) all unresolved public review commenters and/or a PC member who cast negative votes with reason(s) in relation to his/her vote on the consensus body of the ~~BOD~~ Standards Committee action and inform them of their right to appeal that action.

B6.1 An appeal, must be received by the Manager of Standards (MOS) of ASHRAE within 15 working days of the date on the notification letter regarding the ~~Standards Committee~~BOD action. The Chair of the Appeals Board may grant an extension, if requested prior to the close of the initial 15 working day period and if sufficient justification is provided.

B6.2 Normally, any standards action by the ~~BOD~~ Standards Committee will be suspended during pendency of appeal(s), appropriately filed. The President of the Society may, however, maintain the ~~BOD~~ Standards Committee action until and if the Appeals Panel decides to dismiss the appeal, without a hearing, up to a maximum of 90 days. If the Panel decides to dismiss the appeal without a hearing, the President may maintain the action until the next meeting of the ~~Board of Directors~~Standards Committee. The appealed ~~BOD~~ Standards Committee action shall be immediately suspended if the Appeals Panel does not dismiss the appeal.

B8.2 Ineligible Panel Members

Any Member of the Appeals Board that served as a PCVM or PSVM on the project committee that is the subject of the appeal during the three years prior to the standards action under appeal shall be ineligible to serve on the Panel. Any Member of the Appeals Board that voted on

the draft that is the subject of the appeal as a member of the Standards Committee ~~or Board of Directors~~ shall be ineligible to serve on the Panel.

B8.4 Non-Dismissal of Appeal

If the appeal is not dismissed, the ~~BOD StdC~~ action which has been appealed shall be immediately suspended, if not already suspended according to the first sentence of B6.2, and each claim in the appeal shall be considered separately and basic grounds given for each decision.

B9.3 Guests

~~A Standards Committee Liaison and the BOD Ex-Officio member of the Standards Committee shall be invited by MOS to attend the hearing.~~ The hearing shall be open to observation by representatives of directly and materially interested persons, although the number of observers may be limited at the discretion of the Appeals Panel Chair. Anyone planning to attend the hearing shall notify the MOS no less than 15 days prior to the hearing date. Guests that are not designated to speak on behalf of the Appellant or Respondent are not allowed to speak during the hearing or during the question period.

B10 APPEALS PANEL DECISION

The Appeals Panel shall decide within 15 business days of the hearing or after the receipt of the rebuttal, by majority vote, that the appeal, or any parts of the appeal, be upheld or denied. The Appeals Panel Chair shall, within 14 days following the Appeals Panel's decision, notify the Appellant(s), Chief Staff Officer, Director of Technology, Manager of Standards, President, Chair of Technology Council, Chair of the Standards Committee, and Chair of the PC of the decision. The decision of the Appeals Panel to uphold, deny, or dismiss an appeal shall be final. If the appeal is dismissed or denied by the Appeals Panel, the action of the ~~BOD Standards Committee~~, which was appealed shall become effective immediately.

ANNEX C: Complaints of Actions or Inactions by the StdC, its Subcommittees or PCs

In addition to formal appeal of ~~BOD Standards Committee~~ Standards actions or inactions (PASA Annex B), failure of the StdC, its subcommittee(s), or a PC to consider a written complaint may be addressed by writing to the MOS at any time. The complaint must identify the section of procedures that was violated and provide sufficient detail to support the complaint. Any committee tasked with reviewing a complaint may dismiss the claim if insufficient detail is provided.

BACKGROUND: At the Toronto meeting, the Technology Council Operations subcommittee tabled this motion to allow members time to review the proposed. These proposed changes were then also shared as an information item to both Tech Council and the Board of Directors during the Toronto Annual Meeting in June. These changes are part of the Standards Committee effort to streamline the standards development procedures. These changes move the standards actions approvals to the lowest approval body and include a simpler voting calculation to promote efficiency in the standards development process. These changes will have to go out for public review and approval through ANSI. This public review process and approval is between six months and a year depending on the comments received.

Tech C Vote: 11-0-0, CNV

11. Tech Council recommends that proposed changes to the Rules of the Board Section 2.425.001 *Scope and Purpose*, and Section 2.425.003 *Operation*, be approved as shown below:

2.425.001 SCOPE AND PURPOSE

The Standards Committee shall be responsible for the selection, development, and preparation, ~~and submittal to the BOD~~ of all code language documents, standards and guidelines in the

fields of heating, refrigerating, air conditioning, and ventilating engineering, including all revisions, re-affirmations or withdrawals thereof, to be considered for approval. It shall cooperate with and supervise the Society's participation in other organizations in the development, preparation, and adoption of codes, standards and guidelines. (SBL 7.9)

2.425.003 OPERATION

2.425.003.1 General Requirements (11-06-29-13)

A. This committee shall plan and implement activities in support of ASHRAE Policy on Use of ASHRAE Standards in Building Codes. (ROB 1.201.003) (98-01-16-41)

B. This committee shall, as the standards coordinating committee of an ANSI-accredited organization, submit its Procedures for ASHRAE Standards Actions (PASA), and all changes, to ANSI for approval. (95-02-02-54)

C. ASHRAE Standards Committee documents shall be developed in accordance with the Procedures for ASHRAE Standards Actions (PASA) except that balance on guideline project committees is not required but desired.

D. Adoption, revision, reaffirmation or withdrawal of a standard or guideline shall require approval of the ~~Board of Directors~~Standards Committee, and the ~~Board of Directors~~Standards Committee will determine that ASHRAE's procedures have been followed. In the event of credible threat of legal action related to adoption, reaffirmation, or revision of a standard or guideline approval by the Board of Directors shall be required. The effective date of a new, revised or reaffirmed standard, guideline or addendum shall be in accordance with the following unless otherwise approved by the ~~Board of Directors~~Standards Committee.

1. For a new standard the date of ~~Board~~Standards Committee approval of the standard.
2. For a revised standard, which is intended to replace an ANSI-approved American National Standard, the date of ANSI approval of the revised standard. If such standard fails to achieve ANSI approval, the effective date will be determined by the BoardStandards Committee, subsequent to the failure to achieve ANSI approval.
3. For a revised standard which will replace an ASHRAE standard which is not an approved American National Standard, the date of ~~Board~~Standards Committee approval of the revised standard.
4. For an addendum to an ANSI-approved American National Standard that is not code intended, the date of ANSI approval of the addendum. For an addendum to an ANSI-approved American National Standard that is code intended, the date of publication announced on the ASHRAE website. If such addendum fails to achieve ANSI approval, the effective date will be determined by the BoardStandards Committee, subsequent to the failure to achieve ANSI approval. (10-10-23-02)
5. For an addendum to an ASHRAE standard, which is not an ANSI-approved American National Standard the date of ~~Board~~Standards Committee approval.
6. For a new, revised or reaffirmed guideline or addendum to a guideline the date of ~~Board~~Standards Committee approval of the document.

2.425.003.3 (98-01-18-02/05-06-30-27/11-06-29-13)

A. All ASHRAE standards shall be submitted for ANSI approval as American National Standards.

B. ASHRAE may obtain ANSI approval either by utilizing its ANSI Audited Designator status or by submitting to the ANSI Board of Standards Review for approval. Unless otherwise specified by the Board of Directors, the Audited Designator path will be used. (04-07-01-45)

C. Following approval by ~~the Board of Directors~~Standards Committee, an announcement of approval and availability of each standard, guideline, revision or reaffirmation thereof, or withdrawal of a standard or guideline shall be made. (67-06-25-08/86-001-23-56/88-05-21-49/00-06-25-7B)

2.425.003.5 (84-12-19-LB/86-01-23-56/86-06-26-35/88-05-21-49/98-06-25-26/05-06-30-28/06-03-20-09/06-06-29-23/08-01-23-09/10-06-30-21)

A. The Standards Committee evaluates the need for joint sponsorship of standards or guidelines, considering overlap of expertise and ASHRAE responsibility. A request for joint sponsorship, including a recommendation for the lead organization, is submitted to Technology Council for approval and reported to the Board of Directors. If approved, standards writing and approval procedures are negotiated with the other organizations by the Manager of Standards on behalf of the Standards Committee.

B. The standards-writing and approval procedures should be those of the lead organization. If ASHRAE procedures are not adopted, the adopted procedures should be compatible with ASHRAE procedures; e.g., openness of proceedings, public review of drafts, and delegation of technical content to the project committee. The chair and members of the project committee shall be selected and approved in accordance with the negotiated joint sponsorship agreement.

C. The Standards Committee, ~~operating at the direction of the Board of Directors~~, is responsible for recommending the approval of a standard, guideline, or revision, reaffirmation or withdrawal thereof or an addendum. ~~thereto, to the Board of Directors upon recommendation of the Project Committee after reviewing all negative votes cast by the Project Committee, and all unresolved comments. Technology Council is responsible for approving Standards Committee recommendations for publication of users' manuals for selected standards.~~

⁵ David Yashar abstained because he had comments that weren't submitted during the review period and decided that it would be improper to submit them for consideration at this time.



ASHRAE Position Document on Infectious Aerosols

Approved by the ASHRAE Board of Directors [DATE] Expires [DATE]

ASHRAE is a global professional society of over 55,000 members, committed to serve humanity by advancing the arts and sciences of heating, ventilation, air conditioning, refrigeration and their allied fields (HVAC&R). ASHRAE position documents are approved by the Board of Directors and express the views of the Society on specific issues. These documents provide objective, authoritative background information to persons interested in issues within ASHRAE's expertise, particularly in areas where such information will be helpful in drafting sound public policy. The documents also clarify ASHRAE's position for its members and building professionals.

Infectious Aerosols is a Public Interest Issue

The magnitude of risk from aerosolized pathogens has become increasingly obvious, especially during the Covid crisis. These risks are particularly elevated in enclosed buildings.

Public health officials, policy makers, building owners, designers, and members of the public all need accurate, reliable guidance for appropriate ways to mitigate the risk from these pathogens. Available risk mitigation strategies include pharmaceutical interventions, non-engineering controls, and engineering controls. Given the concurrent climate crisis, the optimal mitigation bundle of interventions must achieve the highest possible risk reduction with the lowest possible resultant emissions.

Why ASHRAE Takes Positions on Infectious Aerosols

ASHRAE consensus standards and design guides provide the technical foundation for international building practices and energy codes that balance the need for energy efficiency with the need to keep the indoor environment healthy and comfortable for occupants. The design, installation and operation of buildings' mechanical systems can improve—or can impede—the buildings' ability to mitigate risk from infectious aerosols.

Consequently, ASHRAE's positions, standards and design guidance can help avoid health risks associated with Infectious Aerosols.

ASHRAE Takes The Positions That:

1. Exposure to infectious aerosols is an important factor in the transmission of infections in indoor environments between a source and a susceptible individual.
2. Engineering controls demonstrated to reduce the risk of exposure to infectious aerosols include dilution with outdoor air provided by mechanical or natural ventilation, filtration of indoor air, indoor airflow patterns, and disinfection by germicidal ultraviolet light and other technologies proven to be effective and safe.
3. Strategies using engineering controls for managing the risk from infectious aerosols should focus on reducing exposure to infectious aerosols in the breathing zone.
4. Effective design, installation, maintenance, and operation of ventilation controls are critical to achieve needed risk mitigation.
5. Existing evidence for the effects of temperature and humidity on infection risk does not justify changes to ventilation and IAQ standards, regulations, and guidelines at this time.
6. The effectiveness of any one risk mitigation strategy depends on many factors. The use of multiple risk mitigation strategies will usually be more effective than reliance on any single strategy.
7. Risk mitigation measures should be adaptable to levels of risk in a particular space.
8. Combinations of engineering controls and non-engineering controls can be optimized for effectiveness, cost, and energy use.

ASHRAE Recommends that:

A multidisciplinary Research & Development (R&D) working group be established, aiming to improve coordination between engineers, scientists and health professionals, prioritize and accelerate the research agenda, development process and dissemination. As a minimum, this research should include the following topics.

- Controlled intervention studies to quantify impact on infection transmission resulting from various engineering controls considered singly and in combination with other non-engineering controls with respect to infectious aerosols of varying characteristics.
- Real time detection methodologies for the purpose of improved variable control of HVAC controls responsive to different levels of risk.
- Methods to reduce the life-cycle cost and carbon emissions of engineering controls in all conditions.
- Studies to characterize the size-resolved emission rate of infectious aerosols for different pathogens and different respiratory activities and metabolic intensities, determine the relationship between size and risk of transmission, and predict the fate and transport of these aerosol particles in indoor environments.
- Quantitative infection risk evaluation tools for infectious aerosols (quantitative microbial risk assessment is widely used for water and food, but much less for aerosols).
- Impact of indoor airflow patterns on the transmission of infectious aerosols and resulting risk of infection.

ASHRAE commits to:

1. Support model codes and standards that address exposure to infectious aerosols, balancing quality of evidence, risk mitigation, cost of installation and operation, and energy use and carbon emissions.
2. Support model codes and standards using variable amounts of outdoor/clean air delivery in response to measurement of air quality to optimize indoor air quality in an efficient way.
3. Promote research to enhance HVAC technologies and knowledge to mitigate the risk of infection due to airborne transmission.
4. Develop protocols for better testing and certification of control technologies.
5. Encourage publication of test data indicating removal efficiency by particle size for each filter as part of the certification process. This data should include information on performance effects associated with filter loading and electrostatic charge (if applicable).

Appendix A: Background Information

This document is not a design guide. The purpose is to advise policymakers to identify appropriate engineering control strategies for various settings, various normal/epidemic disease states, and in combination with non-engineering strategies, based on the best available science, the amount of benefits and costs resulting from various strategies including their carbon implications, using principles of Evidence-Based Medicine.

A. Infectious Aerosols Risk

Respiratory diseases are among the most common causes of severe illness and death worldwide (Forum of International Respiratory Societies, 2017). Acute respiratory infections (ARIs) are the leading cause of morbidity and mortality from infectious disease in the world. Almost four million people die from ARIs each year, with 98% of these deaths due to lower respiratory tract infections (World Health Organization, 2014) The current Covid-19 pandemic, caused by the SARS-CoV-2 virus, and the increasing rate of emergent respiratory viral infections in recent years are of great concern, as some of the epidemic-prone ARIs may create global public-health emergencies.

Pathogens are classified in different risk groups describing the relative hazard posed by infectious agents or toxins. Considerations used in a biological risk assessment include the (a) pathogenicity of the agent and infectious dose, the (b) potential outcome of exposure, (c) natural route of infection, (d) other routes of infection resulting from manipulations, the (e) stability of the agent in the environment, (f) information available from animal studies and (g) the availability of effective prophylaxis or therapeutic interventions (World Health Organization Staff & World Health Organization, 2004).

While multiple factors must be considered for risk assessment, design of engineering and environmental mitigation measures should be guided by the specific route of transmission or contaminant dissemination. Transmission of infection is a complex process; the risk of disease is determined by numerous factors that have considerable and uncertain variability including: the characteristics of the pathogen concerned, the infectiousness of the host, the media through which the infectious agent passes from source to new host, and the immune response of the new host (Noakes & Sleight, 2009). Transmission or dissemination through the air complicates this further by adding other influencing factors (Sze To & Chao, 2010).

B. Mechanisms of Transmission of Infectious Aerosols

An infectious aerosol is a collection of pathogen-laden particles in air. Typically, infectious aerosols are released by an infected person as part of respiratory activities such as breathing, talking, singing, coughing and sneezing. All people, whether infected or not, release droplets of respiratory fluid (mucus, sputum or saliva) spanning a wide range of sizes during such respiratory activities. Some droplets are so large that they cannot remain suspended for more than a few seconds in the expired jet. Some droplets are small enough to be considered aerosol particles (aerosols) that can remain suspended in air for an extended period. Under all but the most humid conditions, the smallest droplets rapidly evaporate, leaving behind solid or semi-solid residue consisting of non-volatile components of the respiratory fluid. If a person is infected, their respiratory droplets and aerosols may carry pathogens and may be infectious.

Traditional definitions of “airborne” and “droplet” transmission have been shown to be misleading, and revised definitions of transmission routes are more closely aligned with the actual mechanisms by which pathogens are transferred from one person to another (Marr & Tang, 2021). These revised routes are (1) inhalation of aerosols, (2) spray of large droplets, and (3) touching a contaminated surface. The first supplants the traditional airborne route, which was assumed to apply only at long distance, while the second and third correspond to the traditional droplet and fomite (or contact) routes. To facilitate readability and understanding, this committee agreed to leverage recently proposed terminology.

Inhalation of infectious aerosols can cause infection, though the risk of infection of any individual is a function of the infectivity of the particular organism, its ability to remain infectious in air, the susceptibility to infection of the person exposed, the number of particles inhaled, the amount of infectious virus in the inhaled particles, where the particles are deposited along the respiratory tract, and other factors.

In the past, transmission of most respiratory pathogens was thought to be associated primarily with larger droplets, of concern only to people at close range to an infected person. It is now clear that transmission of COVID-19 and other respiratory infections is likely dominated by inhalation of infectious aerosols both at close range and long range (Wang et al., 2021)

Pathogen-carrying droplets and aerosolized particles that fall to a surface can be a source of infection through touch and subsequent touching of the eyes or nose, or through re-aerosolization (or resuspension) followed by inhalation.

C. Factors affecting respiratory infection risk

Both proximity and duration of exposure to the source - a person who exhales infectious aerosols- are risk factors. Proximity to others influences the risk because airborne pathogens are most concentrated in the expiratory jets close to the point of release (Cortellessa et al., 2021). The concentration of aerosols decreases with distance. As infectious aerosols move through a space, they may lose infectivity over time. The risk of transmission also increases with duration of exposure (Buonanno et al., 2020).

From the perspective of potential risk mitigation interventions, there are three primary factors that influence the chain of infection for aerosolized pathogens: source, route, and susceptibility.

The source encompasses the emitters of the pathogen, the quantity of pathogen produced by each infected host, and the infectiousness of the pathogen.

In the case of aerosolized pathogens, the source will normally be an infected person. In some cases, the source may consist of a surface on which particles have fallen, and which may be re-suspended due to disturbance. In some cases, fecal material and waterborne pathogens may aerosolize to create yet a third kind of source. Many factors influence the risk from a particular source, but the most important is the infectiousness (e.g., transmissibility) of the particular pathogen.

Exhalations release droplets spanning a wide range of sizes, including those small enough to be considered aerosols. The number, size and velocity of these droplets and aerosols vary widely by individual, type of respiratory activity and/or metabolic intensity, volume of vocalization and stage of disease if the person is infected. Speaking loudly, singing, deeper breathing associated with physical activity and the like, increase the number and speed of droplets and aerosols discharged into the air (Coleman et al., 2021; Pöhlker et al., 2021; Tomisa et al., 2021; Wang et al., 2021).

The pathway refers to the physical movement of the pathogen between the source and the new host, the duration of time the source and new host are proximate, the medium of transfer from the source to the new host and the characteristics of the medium (in the case of air, humidity, temperature, indoor airflow patterns, etc.).

Exposure depends on the inhalation rate (volume per unit time), which varies with physical activity (Wang et al., 2021).

Vulnerability refers to the defenses the new susceptible host has to the particular pathogen being transmitted. This refers to both their immune response and behavior. Vulnerability at a population level is affected by the number of potential new hosts in proximity to a source. Therefore, risk is higher in “hubs for community transmission.” Vulnerability at a population level is similarly high in locations with large numbers of persons who are more than normally susceptible to infection and with higher risk of severe disease when infected (Bueno de Mesquita et al., 2022).

D. Managing Risk

Risk from pathogen spread can be reduced by non-engineering interventions (pharmaceutical interventions, administrative controls, etc.), and engineering controls. The risk of exposure to and infection from various aerosolized pathogens is unlikely to be reduced to zero. The goal, therefore, must be to select a bundle of strategies, both engineering and non-engineering, that most practically minimizes risk and minimizes waste.

Given the variability of factors affecting the risk of infection in any given circumstance, no single set of mitigation strategies can balance the evidence, effectiveness, timeliness, and cost against all possible combinations of risk factors.

In general, policymakers face two broad sets of operating conditions: normal circumstances, where we have a somewhat regular level of risks, and epidemic states, where we have temporarily higher levels of risks.

In a normal state, largely because of the public health measures implemented over time, we experience a relatively similar, relatively low risk of transmission of all disease from infectious aerosols in most buildings. Some buildings and spaces, such as healthcare buildings, normally contain larger numbers of infectious persons and larger numbers of immunocompromised or otherwise vulnerable persons. Those spaces therefore warrant higher levels of risk mitigation under normal circumstances.

In an epidemic state, risks step upwards, generally because of the presence of a particular pathogen with a particularly high reproduction rate and few or no medical controls widely available. The risks will vary with public adherence to various behavior protocols (closing bars and shopping malls, social distancing, mask-wearing, etc.).

To mitigate the risks of infection, policymakers have at their disposal different public health measures. These measures include source controls, pathway controls, and controls to protect vulnerable persons. Source controls include administrative controls (limiting access to a space, requiring screening, etc.), pharmaceutical controls (vaccination), Personal Protective Equipment (PPE), isolation/separation, contact tracing to facilitate isolation/separation, and sometimes cleaning or water management. Pathway controls include both engineering controls (powered or natural ventilation, passive and active filtration, air cleaning, indoor airflow patterns, temperature and humidity controls) and non-engineering controls (daylight, surface disinfection, barriers). Controls to protect vulnerable persons include administrative controls, pharmaceutical controls, PPE, and isolation/separation. Usually, the right response to a particular situation will be a bundle of strategies from within each of these categories, which are likely to vary over time in response to evolving levels of risk.

A complicating factor is the *velocity* of risk variation combined with *uncertainty* about the characteristics of a novel disease. The shift from a normal to an epidemic state can occur so rapidly that significant harm may ensue before controls are implemented. However definitive evidence of transmission modes may not be available for a long time and insistence on incontrovertible evidence can cause long delays in response. Consequently, there is a strong argument for invoking the “precautionary principle” in such cases, i.e., “(o)ne should take reasonable measures to avoid threats that are serious and plausible.” (Resnik 2004). Application of the precautionary principle would require that engineering controls capable of coping with the worst likely event are already present and ready for use when needed, or that plans exist for rapidly deploying effective controls. The importance of the precautionary principle also extends to the public health guidance that is essential to the initiation of a timely response to a serious threat.

One important consideration for all policy makers is the need to prescribe controls for the varying states of risk that will be faced by every building. In general, operating at an epidemic-appropriate state all of the time will waste resources. The optimal policy will be one that defines appropriate controls for a normal state (including those spaces with higher than normal levels of risk) with the flexibility to ramp up at appropriate velocity to match a developing epidemic.

An important difficulty that policy makers face in prescribing the optimal bundle of risk mitigation measures is the varying response to administrative controls and PPE measures, and the difficulty of balancing “freedoms.” That is, in some cases, people may refuse to socially distance themselves, vaccinate, and/or wear masks. The need for engineering controls in such instances is much greater as a backstop, but forcing all building owners to spend capital for extensive engineering controls in order to enable the freedom of others to not wear masks is a fundamental collision of rights.

This PD assumes a reasonable implementation of non-engineering controls to mitigate risks by the population at large, and policy makers will be well-advised to use their influence to encourage such implementation.

Policymakers will define acceptable levels of risk and propose optimal risk mitigation responses. The optimal response to risk management, then, will begin with an assumption of a reasonable level of public adoption of recommended public health behaviors. Based on anticipated levels of risk and available resources (including time of response), the response will be a layered set of engineering and non-engineering interventions, tiered from least cost and highest benefit/evidence until the appropriate level of mitigation has been achieved.

ENGINEERING CONTROLS FOR MITIGATING AEROSOL TRANSMISSION

This Position Document uses the term “engineering controls” to refer to a group of measures typically associated with “ventilation.” These include introducing outside air and/or removing contaminated air through mechanical or natural means, controlling flow of air within a space or between spaces, air cleaning (inactivation of infectious aerosols), temperature control, and humidity control. Engineering controls interrupt the pathway for aerosol transmission.

Effective application of most engineering controls requires technical and professional expertise in the design, installation, validation, operation, and maintenance of those controls, implying the need for an ecosystem and financial resources for cost-effective applications (Shen et al., 2021). Systems that do not operate correctly may create a false sense of security, similar to the Peltzman effect (Iyengar et al., 2021), leading occupants to take avoidable risks assuming that the engineering controls will protect them.

Engineering controls for which there is a strong evidence basis for both effectiveness and safety, as well as established quantitative design methods, include ventilation, filtration, certain air cleaning and aerosol inactivation technologies, and effective indoor airflow patterns. Other technologies may also be applicable that are not supported by the same level of independent evidence.

A. Ventilation

Ventilation is the process of supplying air to or removing it from a space by natural or mechanical means for purposes that include control of air contaminant levels. Ventilation may involve supply of outdoor air, recirculated air that has been filtered or otherwise treated, or a combination of the two. Its primary function is to dilute and displace contaminated air in a space by replacing/mixing it with less contaminated or uncontaminated air. Ventilation is closely connected with space air distribution because air flow patterns impact the effectiveness of delivery of ventilation air and can affect occupant exposure.

In many studies, treated outdoor air ventilation rates have shown a positive correlation with indoor air quality, including reduced sick building syndrome symptom incidence and absenteeism and better task performance and learning performance (Sundell et al., 2011). Likewise, higher ventilation rates are associated with lower incidence of airborne diseases. However, systematic reviews of research on the quantitative relationship between risk of infection and ventilation rate have concluded that sufficient data to specify minimum ventilation rates for infection control does not exist (Li et al., 2007).

ASHRAE Standard 62.1 affirms that the rates in the ventilation rate procedure table are not meant for infection control. “The requirements of this table provide for acceptable IAQ. The requirements of this table do not address the airborne transmission of airborne viruses, bacteria, and other infectious contagions.” (ASHRAE 62.1).

Nevertheless, empirically based ventilation rates for the purpose of infection control have been proposed and even implemented in standards and codes in the past. In the early years of the 20th century, Billings proposed, and ASHRAE’s predecessor society ASHVE recommended, outdoor air flow rates of 30 cfm/person (14.2 L/s-person) based on considerations of infection prevention (Janssen, 1999). Current minimum outdoor airflow rates found in standards are typically about 15 cfm/person (ASHRAE, 2019b). During the Covid-19 pandemic, the World Health Organization recommended minimum outdoor airflow rates of 10 L/s-person (21.2 cfm/person) for non-healthcare facilities and 60 L/s-person (127 cfm/person) for most spaces in healthcare facilities (World Health Organization, 2021). What seems indisputable is that existing minimum outdoor air ventilation rates are significantly lower than levels recommended for infection control. This is due to the use of a definition of indoor air quality that does not address infection risk mitigation.

Naturally ventilated buildings, without mechanical ventilation, are common in much of the world. Using a “push-pull” strategy (with features designed both to introduce outside air and to encourage removal of contaminated air) in these buildings will help deliver a continuous supply of outdoor air with minimal stagnant indoor zones (Gilkeson et al., 2013). This strategy will also help to provide a positive or negative pressurization with respect to the external environment for different modes of operation.

Natural ventilation systems are relatively low in both first cost and operating cost, if appropriately integrated into a building during the design phase. These systems also have a low carbon footprint. However, they are difficult to control with precision, they do not permit temperature or humidity control, and they do not filter the incoming air. Mechanical ventilation systems have significantly higher costs, both for initial installation and for ongoing maintenance and operation. Depending on the local fuel mix, these systems also have a relatively high carbon footprint, in the aggregate. However, given the evidence and effectiveness of mechanical ventilation systems, the key to successful deployment is to ensure the maximum effectiveness without incurring excess costs and increasing carbon emissions by ventilating more than needed to reduce transmission risk.

B. Filtration

Filtration removes particles from air within a space or from air that is recirculated by centralized or distributed HVAC system components. Filters used in HVAC applications are typically mechanical filters made from fibers that capture larger particles mainly by interception and impaction, and finer particles mainly by diffusion. Filters are classified by various schemes such as the Minimum Efficiency Reporting Value (MERV) scale defined in ASHRAE Standard 52.2 (2017). The MERV scale runs from 1 to 16, with larger numbers indicating higher efficiency. Filters performance is assessed in three size ranges: 0.3 to 1 μm (E1), 1 to 3 μm (E2) and 3 to 10 μm (E3). ASHRAE Standard 62.1 generally requires filters in HVAC systems of at least MERV 8, which has no specified minimum efficiency in range 1, 20% in range 2, and 70% in range 3. Given the size distribution of respiratory aerosols, MERV 8 filters have low effectiveness for reducing exposure to infectious aerosols. ASHRAE’s Covid-19 guidance

recommended upgrading of filters to MERV 13 if possible. MERV 13 filters have minimum efficiency requirements of 50%, 85%, and 90%, respectively, in ranges 1, 2, and 3. In healthcare and other critical applications, higher MERV filters and even high efficiency particulate air (HEPA) filters tested to be 99.97% or higher efficiency for 0.3 μm particles may be used. It is important to understand that even though filter ratings are generally based on particles 0.3 μm and larger, they can, in fact, capture much smaller particles.

Since filtration is a mechanism designed to permit the re-circulation of already heated/cooled air, it can be deployed to mitigate risk from infectious aerosols while avoiding an increase in the amount of heating/cooling energy. A filter provides resistance to air movement, so moving air through a filter does require higher amounts of fan energy compared to unfiltered air. Since filtration and recirculation of air avoids the need to heat/cool air, it provides a way to mitigate risk with a smaller operating cost relative to simply taking air from the outside and treating it before use. The relative benefit of filtration varies with both climate and seasonal weather, as the energy for heating and cooling varies.

Filtration has been demonstrated to effectively remove particles that could be infectious (Bueno de Mesquita et al., 2022, p. 11). In addition, as the electrical grid becomes increasingly renewable, the carbon footprint of this measure will reduce, as well as reducing the need for initial heating or cooling energy, which generally derives from on-site combustion with its higher carbon footprint.

Filtration can be performed within the ducts for a system, or in a room with a recirculating system. The strength of evidence for the effectiveness of filtration for recirculated air is relatively high (Bueno de Mesquita et al., 2022). As with other ventilation interventions, the question for filtration is not whether it works; the question is how much is needed for how much impact. Liu et al. (2022) performed the systematic scientific review and reported that there is sufficient scientific evidence that in-room air cleaners (IACs) can eliminate airborne SARS-Co-V2. Beyond the effectiveness of an IAC to remove virus laden aerosols, the size and number of units need to be chosen in the context of the volume of the space they are cleaning. Similar to other filtration systems, IACs are associated with increased energy consumption.

C. Other Air Cleaning Technologies

In addition to ventilation and filtration, other technologies exist that inactivate airborne microorganisms or increase the rate of removal of infectious aerosols from the air by electrostatic effects. These include germicidal ultraviolet disinfection (GUV, also referred to as ultraviolet germicidal irradiation, UVGI), and a number of “electronic air cleaners” that produce various reactive species such as ions, hydroxyl radicals, and peroxides, among others. With the exception of GUV, which has been extensively studied and applied for nearly a century (Kowalski, 2010) and is approved by the US Centers for Disease Control and Prevention as a control for tuberculosis in healthcare settings (Jensen et al., 2005; Whalen, 2009), most of these technologies are not well characterized due to a combination of quality of evidence, and, for some, concerns regarding byproduct production. The current status of air cleaning technologies is reviewed in the ASHRAE Position Document on Filtration and Air Cleaning (ASHRAE, 2021).

The main byproduct of concern for electronic air cleaners is ozone, which can be produced by corona discharge and by certain wavelengths of ultraviolet light. One of the two positions of the ASHRAE Filtration and Air Cleaning position document addresses ozone production. It states that ozone based air cleaners should not be used and that extreme caution should be used if air cleaners produce ozone as a byproduct. This concern and position is further reflected in ASHRAE Standard 62.1-2019 (ASHRAE, 2019b), which requires that all electronic air cleaners pass the UL 2998 standard, which requires no more than 5 ppb ozone concentration in the emission of an air cleaner (Underwriters Laboratories Inc., 2020). Both germicidal UV sources and some types of reactive species air cleaners have received this certification. However, ozone is not the only byproduct of concern. Recent research has reported production of various chemical contaminants and aerosols when reactive species air cleaners are used (Joo et al., 2021; Ye et al., 2021). Reactive species themselves (ions, H₂O₂, etc) can also be potentially hazardous (Collins et al, 2021). Whether the amount of such production represents a significant hazard requires further study and is currently one factor that argues for caution in applying air cleaners known to create byproducts.

UV radiation in the UV-C band inactivates microorganisms by affecting genomic and structural components.. The susceptibility of hundreds of microorganisms has been determined experimentally (Kowalski, 2010). The most commonly used germicidal wavelength is 254 nm UV-C produced by mercury vapor or amalgam lamps. Because this wavelength can cause short term eye and skin irritation, and even severe and lasting eye damage, it is applied in ways that prevent or minimize exposure of building occupants. Germicidal ultraviolet systems can be applied in a variety of ways. The oldest implementation of GUV to disinfect air is the “upper room” system in which wall mounted or pendant fixtures create a disinfection zone above the occupied zone. Such systems were first used in the 1930s and demonstrated very good effectiveness against measles and other childhood diseases in schools (Wells et al., 1942). GUV is also effective for airstream disinfection in HVAC systems and in closed air cleaners. (ASHRAE, 2019a) Airstream disinfection systems installed in air handling units can simultaneously prevent microbial growth on cooling coils with resulting reductions in maintenance cost and energy use (Bahnfleth, 2017). Germicidal UV also has been used to disinfect surfaces in unoccupied spaces, in particular, to control healthcare associated infection (HAI) pathogens in healthcare facilities (Weber et al., 2016; Wong et al., 2016).

Emerging germicidal UV source technologies (LEDs and excimer lamps) have the potential to enable new applications of GUV. In particular, “far UV-C” at shorter wavelengths in the UV-C range (approximately 200-230 nm), have demonstrated both good germicidal effectiveness and the potential for safe exposure of occupants. This would permit full-volume irradiation of occupied spaces to simultaneously disinfect air and surfaces, providing protection against both airborne and fomite transmission (Buonanno et al., 2020).

D. Indoor Airflow Patterns

Indoor airflow patterns can affect the flow path of aerosols from the source. The breathing zone of occupants is the most critical space where the concentration and movement of aerosols can directly affect the risk of infection. The effectiveness of ventilation in indoor spaces depends on several factors related to the design and operation of HVAC systems, which can impact the airflow patterns in indoor spaces. Ideally, the clean supply air should sweep the contaminants from the breathing zone

without significant recirculation and stagnation that form pockets of high concentration. Clean air should not escape the space without collecting contaminants from the breathing zone. Indoor airflow patterns, the resulting flow path of airborne contaminants, and the risk of infection can depend on several factors including the number, location, and type of supply diffusers in space; supply airflow rates, air change rates, and associated diffuser throws; supply air temperature; number, size, and locations of return/exhaust grilles; the location and strengths of various heat sources in a room; arrangement of furniture and other obstructions to airflow; location, type, and capacity of in-room air cleaners; and importantly, the relative positions of contaminant sources in space. Strategic selection and layout of air supply diffusers and exhaust grilles can form aerodynamic containment zones of the indoor airflow patterns that can help reduce the risk of contaminant exposure in indoor spaces (Khankari, 2021).

Physical testing and real-time measurements of all the parameters that affect the ventilation performance of enclosed spaces are often time and labor-intensive, if not impossible. In such situations, Computational Fluid Dynamics (CFD) analyses provide a feasible alternative to gain comprehensive insights into the ventilation performance. CFD analyses, if performed properly with adequate expertise, can help designers understand complex indoor airflow patterns and the flow path of aerosols. Such insights gained during the early stages of the design and retrofit process can help improve the ventilation performance and reduce the risk of infection in indoor spaces (Khankari, 2016, 2021).

Effective indoor airflow patterns (Bolashikov & Melikov, 2009; Khankari, 2021) are a primary factor that drives the dilution and not solely quantity of air that is supplied to the space. No studies have provided sufficient data to quantify the amount of ventilation needed to achieve effective risk mitigation (Bueno de Mesquita et al., 2022; Li et al., 2007). The key underlying reason is the lack of data related to the infectious source strength and dose-response to estimate the necessary level of dilution (Li et al., 2007; Pantelic & Tham, 2012).

There has been an increased awareness of IAQ in the microenvironment during the COVID-19 pandemic that has led to the exploration of innovative ventilation systems and indoor airflow strategies. Personalized ventilation systems that supply 100% outdoor, filtered, or UV-disinfected air directly to the occupant's breathing zone could offer protection against exposure to contaminated air and mitigate the risk of infectious aerosol transmission (Bolashikov et al., 2009; Cermak et al., 2006; Danca et al., 2022; Ghaddar & Ghali, 2022; Licina, Melikov, Pantelic, et al., 2015; Licina, Melikov, Sekhar, et al., 2015; Pantelic et al., 2009, 2015). Personalized ventilation systems, when coupled with localized or personalized exhaust devices, further enhance the overall ability to mitigate exposure in breathing zones, as seen from both experimental and CFD studies in healthcare settings (Bivolarova et al., 2016; Bolashikov et al., 2015; Yang et al., 2014; Yang et al., 2013, 2014, 2015). There are no known epidemiological studies that clearly demonstrate a reduction in infectious disease transmission from indoor airflow patterns.

Evidence of the effectiveness for indoor airflow control to mitigate risk from infectious aerosols is moderate (Bueno de Mesquita et al., 2022, p. 15).

Indoor airflow pattern control incurs little additional cost or carbon beyond basic ventilation strategies, but may require more extensive design expertise with attendant costs.

E. Humidity and temperature control

Research suggests that the persistence of various infectious pathogens in aerosols may be affected by environmental conditions, including temperature and humidity (Tang, 2009). Different pathogens respond differently to varying temperature and humidity conditions. Therefore, attempting to modify risk through these mechanisms is problematic. "Although evidence exists that survival time of SARS-CoV-2 virus is longer at low temperature and humidity, it is not clear that manipulation of either temperature or humidity as risk mitigation measures will have a major impact compared to other controls." (W. Bahnfleth & Degraw, 2021) ([Yang & Marr, 2011](#)).

Humidification imposes significant costs for both installation and operation, and generates a significant energy and carbon footprint. It can also create other microbial issues (e.g. mold growth) within the built environment.

F. Demand-controlled ventilation

Ventilation has long been based on estimates of the number of people in a space or the volume of the space. These are static estimates of the necessary flow and do not always adjust as occupancy changes. The use of carbon dioxide (CO₂) concentration as a proxy for ventilation rate per occupant, is commonly used to modulate the flow of ventilation air (Bhagat et al., 2020; Franco & Schito, 2020; Zivelonghi & Lai, 2021). However, there are challenges with this approach as CO₂ measurements may not always be representative of the actual demand in a given space, especially with multi-zone recirculation type VAV systems. Additionally, it is important to note that CO₂ concentration is unaffected by filtration and most other air cleaning methods, so it should not be used as a direct indicator of infection risk. ASHRAE has developed a separate Position Document and guidance documents that address the use of CO₂ for control of indoor air quality, including risk of airborne infection. (ASHRAE, 2022).

New sensor technologies allow for the direct measurement of fine airborne particulate (PM_{2.5}), which may include infectious aerosols (Kaliszewski et al., 2020). Increasing availability and falling cost of PM sensors suggests that their use for ventilation control may be feasible. Low-cost IAQ sensors for continuous monitoring (Zhang et al., 2021) and as early warning systems for COVID-19 infections (Peladarinos et al., 2021) have been reported. While the sensors cannot differentiate between infectious aerosols and other types of particulate matter, the concentration of fine particulates is an important measure of air quality that can be used to modulate the flow of ventilation or control of air cleaning systems. Additional research and application protocols are needed, including protocols to validate performance..

NON-ENGINEERING CONTROLS FOR AEROSOL TRANSMISSION

Non-engineering controls generally target reduction of the source, and protection of vulnerable new hosts.

A. Pharmaceutical Controls

Pharmaceutical controls include vaccination, prophylaxis, treatment, and other strategies. In general, these strategies work to reduce the source (e.g. number of infected persons, amount of aerosolized

pathogens), and to protect the vulnerable new host. These strategies generally do not work to affect the path of transmission.

Two features of pharmaceutical controls make them problematic in some ways. First, pharmaceutical controls rely on public adherence, and adequate access. Experience shows that neither is perfect, and, so, by themselves, pharmaceutical controls can be insufficient to the task. Second, especially in the context of an epidemic, where velocity of change in risk is high, these controls may not be adequate to the risk mitigation need.

Therefore, as with other non-engineering control measures, this one is vitally important, but often insufficient by themselves .

B. Elimination of the Hazard

Elimination of the hazard literally separates sources of infection from uninfected populace. Examples of such interventions might include stay at home orders to keep people from coming into contact with one another to minimize risk of transmission or closing buildings or spaces to some or all people. Other examples of this kind of elimination strategy are social distancing (separating the source of infection by a distance calculated to mitigate the risk of transmission) and barriers between persons in a space. In the case of droplets, but not aerosols, barriers between people in a space can mitigate transmission risk (Wang et al., 2021, p. 15).

Elimination-of-the-hazard strategies are highly dependent upon compliance by the population, and therefore, they are heavily dependent upon voluntary compliance. During normal times, threat levels are low enough that sloppy uptake and adherence is relatively unimportant. Variation in compliance during epidemics and in high-risk locations may be highly problematic and will call on leaders to lead responsibly and effectively.

The recent experience with COVID-19 shows dramatically the potential variance in uptake of such measures, and the ensuing results for local, regional, national and international populations.

In some sense, stay at home orders might be seen to be relatively low-cost, low-energy interventions. However, they also have serious economic implications to certain segments of the working population, as well as to the economy as a whole. Some workers, deemed to be essential, must continue to work through a time of elevated risk, creating stark inequities in terms of risk exposure. These factors accumulate as their enforcement endures over time.

C. Administrative Controls

Administrative controls are exercised by the entities who control access to, and use of particular spaces. These strategies include shutting down buildings or spaces; limiting the number of people and duration of occupancy in buildings or spaces; and requirements for vaccinations, testing, and PPE.

The strategy of shutting down buildings or spaces altogether by definition eliminates the risk within those buildings and spaces. The cost and energy/carbon impacts are both relatively low, in terms of direct cost. However, the cost to an economic entity, the people who must derive their incomes from

working there, the people who are denied services that might have come from the activities in the building, and the cost to the economy as a whole can be huge.

A more nuanced approach is to use administrative controls to limit the number and distance between people in a building or space, including limiting the amount of time that one or more persons are permitted into a space. The efficacy of this strategy will vary as a function of pathogen reproduction rates, and the details and effectiveness of the implementation. On the whole, however, this strategy can mitigate the costs of the building shut-down strategy while capturing many of the benefits. It will therefore reduce many of the indirect costs of the building shut-down strategy while imposing additional costs to the entity implementing the administrative controls.

A third class of administrative controls is over the personal behaviors of the building occupants. That is, the entity controlling access to a building or space can require proof of vaccination, or testing, or PPE as a condition precedent to a person entering a space. This strategy uses the high efficacy of the individual strategies with an overlay of administrative control to enforce certain levels of risk mitigation. In general, this kind of strategy is a higher cost than administrative controls focused strictly on numbers, but with higher efficacy. Building owners must account for jurisdictional laws regulating the disclosure of personal health information when requiring proof of vaccination or testing.

D. Cleaning

Cleaning may provide a benefit when aerosolized or droplet pathogens may be deposited on surfaces where they have a long enough life to come into contact, either physical or re-entrainment in the air – with an uninfected person. Thorough cleaning in its many forms can greatly mitigate this risk, where it occurs. Evidence of benefits of cleaning to reduce transmission of aerosolized pathogens, however, is weak (Bueno de Mesquita et al., 2022, p. 15).

E. Masking and PPE

Masking can either contain a pathogen, if the wearer is infected, or protect against a pathogen, for non-infected persons. Evidence shows that this strategy can be highly effective, and has very low costs and very low carbon impact (Wang et al., 2021).

F. Barriers

The use of plastic barriers within a space may provide some mitigation against spray of droplets at short distances, but only with corresponding modifications to ventilation systems (Capron, et. Al 2022). In some cases, plastic barriers within rooms increase risk (de Mesquita, 2021) . Height of barriers are more impactful than width of barriers. Evidence for the effectiveness of barriers is low, but costs and energy costs are low.

Appendix B: Strength of Recommendations Taxonomy Analysis

A. Introduction

This appendix attempts to bridge the world of evidence based medicine (EBM) and the imperative to use available evidence to make needed recommendations in the practical world of application of ventilation systems. Historically, the world of application of ventilation systems has not had the kinds of investments into research necessary to reach the levels demanded by the rigors of EBM. However, decisions have to be made, based on the best available evidence. Bringing these worlds together brings a level of transparency and rigor to the practical need for guidance to policymakers, while also representing a call for further research to provide us with better data in the future.

Policymakers confront innumerable challenges in determining how to allocate incentives and penalties in guiding the public towards outcomes that best balance risks and rewards. The science of ventilation is still imprecise with respect to the specification of minimum rates to control transmission of infectious aerosols. Thus, policymakers need to have the most rigorous, transparent information at their disposal with which to make needed determinations. Policymakers also need to prioritize research to better determine the effectiveness of the various strategies so as to permit better prescriptions in the future. The methodology used in this exercise takes an important step towards addressing this need.

Because we are dealing with interventions targeting a health outcome - we are using ventilation as an intervention to reduce risk of infection - we have chosen to develop a version of a tool commonly used in Evidence Based Medicine (EBM).

The essence of EBM is to provide guidance to practitioners and policymakers by integrating the best research evidence with clinical expertise and patient values (Sackett et al, 2000), as well as the setting and circumstances in which health interventions are being delivered (G. Guyatt et al., 2008). A central methodology for EBM is the use of Strength of Recommendation Taxonomy (SORT). In general, SORT methodologies try to assess the evidence supporting the use of a particular intervention, balanced against undesirable aspects of the intervention, such as side-effects (G. H. Guyatt et al., 2008).

Direct translation of EBM methodologies to the science of ventilation is difficult, due to the type of evidence generally available for informing ventilation decisions. This effort uses an appropriate SORT to provide both rigor and transparency, in ways that should elevate the credibility of the recommendations.

B. Measuring Quality of Evidence

The SORT begins with an assessment of available evidence. Here, the Quality of Evidence was assessed using the below described methodology. A search question was developed for each intervention comparing outcome with and without the specific engineering measure. i.e., in areas with airborne pathogen transmission (Population), what is the effect of Air Cleaning (UVGI) (Intervention) on respiratory pathogens transmission (Outcome) compared with settings without UVGI technology (Control). With the developed PICO (Population, Intervention, Control, Outcome), a literature search was done in JSTOR digital library, PubMed and ScienceDirect.

Only systematic reviews addressing the specific intervention and respiratory pathogens were included. Only 6 papers were finally included.

- Dandnayak, D., Zhong, L., & Hartling, L. (2021). *The impact of heating , ventilation , and air conditioning design features on the transmission of viruses , including the 2019 novel coronavirus : a systematic review of ultraviolet radiation*.
<https://www.medrxiv.org/content/10.1101/2021.10.12.21264904v1.full.pdf>
- Liu, D. T., Philips, K. M., Speth, M. M., Besser, G., Mueller, C. A., & Sedaghat, A. R. (2021). Portable HEPA Purifiers to Eliminate Airborne SARS-CoV-2: A Systematic Review. *Otolaryngology - Head and Neck Surgery (United States)*.
<https://doi.org/10.1177/01945998211022636>
- National Collaborating Center for Environmental Health. (2021). *A rapid review of the use of physical barriers in non-clinical settings and COVID-19 transmission*.
<https://nceh.ca/documents/evidence-review/rapid-review-use-physical-barriers-non-clinical-settings-and-covid-19>
- Talic, S., Shah, S., Wild, H., Gasevic, D., Maharaj, A., Ademi, Z., Li, X., Xu, W., Mesa-Eguiagaray, I., Rostron, J., Theodoratou, E., Zhang, X., Motee, A., Liew, D., & Ilic, D. (2021). Effectiveness of public health measures in reducing the incidence of covid-19, SARS-CoV-2 transmission, and covid-19 mortality: systematic review and meta-analysis. *BMJ*, 375.
<https://doi.org/10.1136/BMJ-2021-068302>
- Thornton, G. M., Fleck, B. A., Kroeker, E., Dandnayak, D., Fleck, N., Zhong, L., & Hartling, L. (2021). The impact of heating, ventilation, and air conditioning design features on the transmission of viruses, including the 2019 novel coronavirus: a systematic review of ventilation and coronavirus. *MedRxiv*, 2021.10.08.21264765. <https://doi.org/10.1101/2021.10.08.21264765>
- World Health Organization. (2019). *Non-pharmaceutical public health measures for mitigating the risk and impact of epidemic and pandemic influenza*.
<https://www.who.int/publications/i/item/non-pharmaceutical-public-health-measures-for-mitigating-the-risk-and-impact-of-epidemic-and-pandemic-influenza>

While the quality of evidence from the strict perspective of Evidence-Based Medicine is low, another class of studies, properly classified as “Natural Experiments” has gained attention in areas where controlled trials are difficult (DiNardo, 2008) (Dinardo, 2010). Indeed, the 2021 Nobel prize in economics was awarded to pioneers in the use of Natural Experiments. In some sense, the kinds of studies generally available with respect to the value of ventilation in mitigating risk, as powerfully exemplified by the work of the ASHRAE Epidemic Task Force during the Covid crisis, fall squarely in this domain. And, while the worlds of science and law may have an uneasy relationship, various legal standards for decision making use a preponderance of such evidence in the face of uncertainty – the kind of uncertainty that inevitably faces policymakers. In coming to their conclusions, experts such as those carefully assembled for this Position Document must rely heavily on such Natural Experiments, along with fundamental, inviolable laws of physics combined with an understanding of exposure and dose, to inform their judgments. And, so, we have expressed the available evidence from the strict perspective of Evidence Based Medicine and the indirect evidence from the perspective of the Natural Experiments and fundamental science currently available to us.

C. Assessing the Benefit, Cost, and Energy/Carbon Impacts of an Intervention

A key insight for SORT is the balance between “the desirable and undesirable consequences of the alternative management strategies, on the basis of the best estimates of those consequences” G. H. Guyatt et al., 2008). In our case, the benefits are impossible to quantify. That is, given the wide range of pathogens of different virulence and infectivity, coupled with the uncertain adoption of other non-ventilation interventions, the line-drawing problem associated with ventilation strategies (how much better are 4 air changes per hour than 2?); and the difficulty of predicting the frequency of occurrence make the benefits impossible to state with precision. Therefore, we rely on a multi-disciplinary, expert consensus-based estimate of effectiveness using the Delphi Technique. (Yousuf, 2007)

The Delphi Technique obtains consensus within a panel of experts through a series of questionnaires that are fed back to the panel after each subsequent round. It was the most suitable method for this committee because:

1. The Delphi methodology gathers opinion without the need to bring panelists together physically; especially problematic with a cohort of experts geographically dispersed.
2. Questionnaires are completed independently and confidentially, preventing the dominance of particular individuals and allowing participants to express their ideas without worry of being associated with those ideas. This could not be achieved using focus group discussion.
3. The feedback process encourages participants to consider items raised by others which they may have missed themselves and allows them to change opinion throughout the process (Couper, 1984) . It also presents the group collective opinion in a non-adversarial manner (Hasson et al., 2000). This type of feedback mechanism is absent from direct interviews. (Smithson, 2000)

The technique involves three basic steps.

The first survey or questionnaire sent to the panel of experts (in this case, the members of this committee) asks for a list of opinions involving experiences and judgments and a list of predictions. In the second round, a copy of the collective list is sent to each expert, and the expert is asked to rate each item by criterion of importance provided in the survey. The third questionnaire includes the list, the ratings indicated, and the consensus. The experts are asked to either revise their opinions or discuss their reasons for not coming to consensus with the group.

The cost of each item was assessed as an “average” of life cycle cost, including both first cost and on-going cost. These costs are a kind of aggregate average, and do not necessarily reflect the relative costs in any particular location. Note that this estimate is a relative one, in that it distinguishes between absolute costs, and not costs in the context of available resources. So, for example, one strategy might be considered low cost in a relatively affluent setting, but a high cost in a relatively low-resourced setting. Nonetheless, in either event it will be lower in cost than other alternatives, and, so, we note it to be a low-cost strategy.

A second dimension of cost is the cost in energy consumption and resulting carbon emissions. Recognizing the science and the urgency of the need to address climate change, together with the heavy influence of the built environment on this critical issue, ASHRAE has recently created a team to study ways to decarbonize buildings. Consistent with the science and the direction of this

organization, we thus provide relative estimates of the lifetime emissions potential of the strategies under consideration. Obviously, the urgency of an epidemic may outweigh the much more diffuse and longer-range impacts of climate change associated with a particular strategy. However, we also recognize that the mass deployment of a particular strategy that is higher in global warming potential (GWP) will create a permanent source of emissions. So, in comparing two potential strategies, each with similar evidence and similar benefit, we should prefer the solution with lower GWP.

D. Recommendations

The final step in a SORT is to reach a recommendation based on the strength of evidence and the balance between desirable and undesirable aspects of a particular intervention.

Some versions of SORT use algorithms to derive the strength of recommendation from the Benefit, Cost and Strength of Evidence. In our assessment, due to the relative lack of definitive research, we again used the Delphi technique to best determine the consensus of our Committee of Experts. The resulting table, then, expresses our best attempt to tier our recommended measures for risk mitigation, based on the best evidence we were able to assemble. This exercise indicates a need for a multi-disciplinary in-depth research involving these techniques and a large pool of subject matter experts from a wide variety of disciplines.

E. Summary of Strategies

The current evidence of the association between ventilation rate and airborne infection is weak in terms of study design. However, there is solid indirect evidence to show that increased ventilation and related strategies discussed herein are associated with a reduced risk of airborne infection (Li et al., 2007). Ventilation mitigates risk, but the minimum ventilation requirements to mitigate the risk of infectious aerosols demand further investigation.

We acknowledge that, from the strict perspective of rigorous evidence-based medicine, the available evidence has low quality due to the specific set of methods and procedures used to collect and analyze data in ecological and retrospective studies. The ethical limitations, the multiple factors involved in airborne mechanisms and the specificity of indoor ventilation dynamics, urge an innovative methodology to produce solid evidence to inform building environment regulatory bodies and public health institutions.

Strategy	Quality of evidence (from EBM perspective)	Indirect evidence	Magnitude of Benefit	Life Cycle Cost	Energy and Carbon	Strength of Recommendation
Physical distancing	Moderate	High *	Moderate	Low	Low	Strong recommendation
Barriers between occupants	Low	Low *	Low	Moderate	Low	Conditional recommendation
Surface and object cleaning	Low	Moderate *	Low	Low	Low	Conditional recommendation
Face mask	Moderate	High *	High	Low	Low	Strong recommendation
Right-sized ventilation -Natural	Low	High **	Moderate	Low	Low	Strong recommendation
Right-sized ventilation - Mechanical	Low	High **	High	High	High	Strong recommendation
Filtration (requires mechanical ventilation)	Moderate	High **	Moderate	Moderate	High	Recommendation
Air Cleaning (UVGI)	Moderate	High **	Moderate	High	Moderate	Conditional recommendation
Air Cleaning (Other)	None	Low **	Low	High	Moderate	Weak recommendation
Indoor airflow patterns	Moderate	High **	High	Moderate	Low	Recommendation
Humidity control (requires mechanical ventilation)	None	Low **	Low	High	High	Weak recommendation

* Schenk et al., 2021

** Bueno de Mesquita et al., 2022

REFERENCES

- ASHRAE. (2017). Standard 52.2 Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size. *Atlanta, GA, USA: American Society of Heating, Refrigerating, and Air-Conditioning Engineers.*
- ASHRAE. (2019a). *ASHRAE Handbook—2019 HVAC Applications. Chapter 62, Ultraviolet Air and Surface Treatment.* ASHRAE.
- ASHRAE. (2021). *ASHRAE Position Document on Filtration and Air Cleaning.*
- ASHRAE. (2022). *ASHRAE Position Document on Indoor Carbon Dioxide.*
- ASHRAE, A. (2019b). Standard 62.1-2019, Ventilation for Acceptable Indoor Air Quality. *Atlanta, GA, USA: American Society of Heating, Refrigerating, and Air-Conditioning Engineers.*
- Bahnfleth, W., & Degraw, J. (2021). Reducing Airborne Infectious Aerosol Exposure. *ASHRAE Journal*, 63(5), 18–21.
- Bahnfleth, W. P. (2017). Cooling coil ultraviolet germicidal irradiation. *ASHRAE Journal*, 59(10), 72–74.
- Bhagat, R. K., Davies Wykes, M. S., Dalziel, S. B., & Linden, P. F. (2020). Effects of ventilation on the indoor spread of COVID-19. *Journal of Fluid Mechanics*, 903, F1. Cambridge Core. <https://doi.org/10.1017/jfm.2020.720>
- Bivolarova, M. P., Melikov, A. K., Mizutani, C., Kajiwara, K., & Bolashikov, Z. D. (2016). Bed-integrated local exhaust ventilation system combined with local air cleaning for improved IAQ in hospital patient rooms. *Building and Environment*, 100, 10–18. <https://doi.org/10.1016/j.buildenv.2016.02.006>
- Bolashikov, Z. D., Barova, M., & Melikov, A. (2015). Wearable personal exhaust ventilation (WPEV): Improved indoor air quality and reduced exposure to air exhaled from a sick doctor. *Science and Technology for the Built Environment*, 21, 00–00. <https://doi.org/10.1080/23744731.2015.1091270>
- Bolashikov, Z. D., & Melikov, A. K. (2009). Methods for air cleaning and protection of building occupants from airborne pathogens. *The 6th International Conference on Indoor Air Quality, Ventilation & Energy Conservation in Buildings (IAQVEC 2007), Sendai, Japan, 28-31 October, 2007*, 44(7), 1378–1385. <https://doi.org/10.1016/j.buildenv.2008.09.001>
- Bueno de Mesquita, P. J., Delp, W. W., Chan, W. R., Bahnfleth, W. P., & Singer, B. C. (2022). Control of airborne infectious disease in buildings: Evidence and research priorities. *Indoor Air*, 32(1), e12965. <https://doi.org/10.1111/ina.12965>
- Buonanno, G., Morawska, L., & Stabile, L. (2020). Quantitative assessment of the risk of airborne transmission of SARS-CoV-2 infection: Prospective and retrospective applications. *Environment International*, 145, 106112. <https://doi.org/10.1016/j.envint.2020.106112>
- Buonanno, M., Welch, D., Shuryak, I., & Brenner, D. J. (2020). Far-UVC light (222 nm) efficiently and safely inactivates airborne human coronaviruses. *Scientific Reports*, 10(1), 10285. <https://doi.org/10.1038/s41598-020-67211-2>
- Capron, A., Garc, P., and Schenk, E., (2022). Public Health Lessons for Non-Vaccine Influenza Interventions: Looking Past COVID-19. National Academy of Medicine. <https://doi.org/10.17226/26283>.
- Cermak, R., Melikov, A. K., Forejt, L., & Kovar, O. (2006). Performance of Personalized Ventilation in Conjunction with Mixing and Displacement Ventilation. *HVAC&R Research*, 12(2), 295–311. <https://doi.org/10.1080/10789669.2006.10391180>
- Coleman, K. K., Tay, D. J. W., Tan, K. S., Ong, S. W. X., Than, T. S., Koh, M. H., Chin, Y. Q., Nasir, H., Mak, T. M., Chu, J. J. H., Milton, D. K., Chow, V. T. K., Tambyah, P. A., Chen, M., & Tham, K. W. (2021). Viral Load of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) in Respiratory Aerosols Emitted by Patients With Coronavirus Disease 2019 (COVID-19) While Breathing, Talking, and Singing. *Clinical Infectious Diseases*, ciab691. <https://doi.org/10.1093/cid/ciab691>
- Collins, Douglas B., and Farmer, Delphine K., (2021). Unintended Consequences of Air Cleaning Chemistry. *Environmental Science & Technology* 55 (18), 12172-12179.

- Cortellessa, G., Stabile, L., Arpino, F., Faleiros, D. E., van den Bos, W., Morawska, L., & Buonanno, G. (2021). Close proximity risk assessment for SARS-CoV-2 infection. *The Science of the Total Environment*, 794, 148749–148749. PubMed. <https://doi.org/10.1016/j.scitotenv.2021.148749>
- Couper, M. (1984). The Delphi technique: Characteristics and sequence model. *ANS Adv Nurs Sci*, 7(1), 72–77. PubMed. <https://doi.org/10.1097/00012272-198410000-00008>
- Danca, P., Coşoiu, C. I., Nastase, I., Bode, F., & Georgescu, M. R. (2022). Personalized Ventilation as a Possible Strategy for Reducing Airborne Infectious Disease Transmission on Commercial Aircraft. *Applied Sciences*, 12(4). <https://doi.org/10.3390/app12042088>
- Dinardo, J. (2010). Natural Experiments and Quasi-Natural Experiments. In S. N. Durlauf & L. E. Blume (Eds.), *Microeconometrics* (pp. 139–153). Palgrave Macmillan UK. https://doi.org/10.1057/9780230280816_18
- Forum of International Respiratory Societies. (2017). *The Global Impact of Respiratory Disease – Second Edition*. European Respiratory Society. https://www.who.int/gard/publications/The_Global_Impact_of_Respiratory_Disease.pdf
- Franco, A., & Schito, E. (2020). Definition of Optimal Ventilation Rates for Balancing Comfort and Energy Use in Indoor Spaces Using CO2 Concentration Data. *Buildings*, 10(8). <https://doi.org/10.3390/buildings10080135>
- Ghaddar, N., & Ghali, K. (2022). Ten questions concerning the paradox of minimizing airborne transmission of infectious aerosols in densely occupied spaces via sustainable ventilation and other strategies in hot and humid climates. *Building and Environment*, 214, 108901. <https://doi.org/10.1016/j.buildenv.2022.108901>
- Gilkeson, C. A., Camargo-Valero, M. A., Pickin, L. E., & Noakes, C. J. (2013). Measurement of ventilation and airborne infection risk in large naturally ventilated hospital wards. *Building and Environment*, 65, 35–48. <https://doi.org/10.1016/j.buildenv.2013.03.006>
- Guyatt, G., Oxman, A. D., Kunz, R., Falck-Ytter, Y., Vist, G. E., Liberati, A., & Schünemann, H. J. (2008). Going from evidence to recommendations. *BMJ*, 336(7652), 1049. <https://doi.org/10.1136/bmj.39493.646875.AE>
- Guyatt, G., Rennie, D., Meade, M., & Cook, D. (2008). *Users' guides to the medical literature: A manual for evidence-based clinical practice*. McGraw Hill. <https://www.ebcp.com.br/simple/upfiles/livros/005EEBM.pdf>
- Hasson, F., Keeney, S., & McKenna, H. (2000). Research guidelines for the Delphi survey technique. *Journal of Advanced Nursing*, 32(4), 1008–1015.
- Iyengar, K. P., Ish, P., Botchu, R., Jain, V. K., & Vaishya, R. (2021). Influence of the Peltzman effect on the recurrent COVID-19 waves in Europe. *Postgraduate Medical Journal*, postgradmedj-2021-140234. <https://doi.org/10.1136/postgradmedj-2021-140234>
- Janssen, J. E. (1999). The history of ventilation and temperature control: The first century of air conditioning. *Ashrae Journal*, 41(10), 48.
- Jensen, P. A., Lambert, L. A., Iademarco, M. F., & Ridzon, Renee. (2005). Guidelines for preventing the transmission of Mycobacterium tuberculosis in health-care settings, 2005. *MMWR. Recommendations and Reports : Morbidity and Mortality Weekly Report. Recommendations and Reports / Centers for Disease Control*. 2005; 54(RR-17):1-141., 54(17). <https://stacks.cdc.gov/view/cdc/6659>
- Joo, T., Rivera-Rios, J. C., Alvarado-Velez, D., Westgate, S., & Ng, N. L. (2021). Formation of Oxidized Gases and Secondary Organic Aerosol from a Commercial Oxidant-Generating Electronic Air Cleaner. *Environmental Science & Technology Letters*, 8(8), 691–698. <https://doi.org/10.1021/acs.estlett.1c00416>
- Kaliszewski, M., Włodarski, M., Młyńczak, J., & Kopczyński, K. (2020). Comparison of Low-Cost Particulate Matter Sensors for Indoor Air Monitoring during COVID-19 Lockdown. *Sensors*, 20(24). <https://doi.org/10.3390/s20247290>
- Khankari, K. (2016). Patient room HVAC. *ASHRAE Journal*, 58(6), 16.

- Khankari, K. (2021). Analysis of spread of airborne contaminants and risk of infection. *ASHRAE Journal*, 63(7), 14–20.
- Kowalski, W. (2010). *Ultraviolet germicidal irradiation handbook: UVGI for air and surface disinfection*. Springer science & business media.
- Li, Y., Leung, G. M., Tang, J., Yang, X., Chao, C., Lin, J. Z., Lu, J., Nielsen, P. V., Niu, J., & Qian, H. (2007). Role of ventilation in airborne transmission of infectious agents in the built environment—a multidisciplinary systematic review. *Indoor Air*, 17(1), 2–18.
- Licina, D., Melikov, A., Pantelic, J., Sekhar, C., & Tham, K. W. (2015). Human convection flow in spaces with and without ventilation: Personal exposure to floor-released particles and cough-released droplets. *Indoor Air*, 25(6), 672–682. <https://doi.org/10.1111/ina.12177>
- Licina, D., Melikov, A., Sekhar, C., & Tham, K. W. (2015). Human convective boundary layer and its interaction with room ventilation flow. *Indoor Air*, 25(1), 21–35. <https://doi.org/10.1111/ina.12120>
- Liu, D. T., Phillips, K. M., Speth, M. M., Besser, G., Mueller, C. A., & Sedaghat, A. R. (2022). Portable HEPA Purifiers to Eliminate Airborne SARS-CoV-2: A Systematic Review. *Otolaryngology–Head and Neck Surgery*, 166(4), 615–622. <https://doi.org/10.1177/01945998211022636>
- Noakes, C. J., & Sleight, P. A. (2009). Mathematical models for assessing the role of airflow on the risk of airborne infection in hospital wards. *Journal of the Royal Society Interface*, 6(suppl_6), S791–S800.
- Pantelic, J., Sze-To, G. N., Tham, K. W., Chao, C. Y., & Khoo, Y. C. M. (2009). Personalized ventilation as a control measure for airborne transmissible disease spread. *Journal of the Royal Society Interface*, 6(suppl_6), S715–S726.
- Pantelic, J., & Tham, K. W. (2012). Assessment of the mixing air delivery system ability to protect occupants from the airborne infectious disease transmission using Wells–Riley approach. *HVAC&R Research*, 18(4), 562–574. <https://doi.org/10.1080/10789669.2012.647230>
- Pantelic, J., Tham, K. W., & Licina, D. (2015). Effectiveness of a personalized ventilation system in reducing personal exposure against directly released simulated cough droplets. *Indoor Air*, 25(6), 683–693. <https://doi.org/10.1111/ina.12187>
- Peladarinos, N., Cheimaras, V., Piromalis, D., Arvanitis, K. G., Papageorgas, P., Monios, N., Dogas, I., Stojmenovic, M., & Tsaramiris, G. (2021). Early Warning Systems for COVID-19 Infections Based on Low-Cost Indoor Air-Quality Sensors and LPWANs. *Sensors*, 21(18). <https://doi.org/10.3390/s21186183>
- Pöhlker, M. L., Krüger, O. O., Förster, J.-D., Berkemeier, T., Elbert, W., Fröhlich-Nowoisky, J., Pöschl, U., Pöhlker, C., Bagheri, G., & Bodenschatz, E. (2021). Respiratory aerosols and droplets in the transmission of infectious diseases. *ArXiv Preprint ArXiv:2103.01188*.
- Schenk, E., García, P., & Capron, A. (2021). *Public Health Lessons for Non-Vaccine Influenza Interventions: Looking Past COVID-19*.
- Shen, J., Kong, M., Dong, B., Birnkrant, M. J., & Zhang, J. (2021). Airborne transmission of SARS-CoV-2 in indoor environments: A comprehensive review. *Science and Technology for the Built Environment*, 27(10), 1331–1367. <https://doi.org/10.1080/23744731.2021.1977693>
- Smithson, J. (2000). Using and analysing focus groups: Limitations and possibilities. *International Journal of Social Research Methodology*, 3(2), 103–119. <https://doi.org/10.1080/136455700405172>
- Sundell, J., Levin, H., Nazaroff, W. W., Cain, W. S., Fisk, W. J., Grimsrud, D. T., Gyntelberg, F., Li, Y., Persily, A. K., Pickering, A. C., Samet, J. M., Spengler, J. D., Taylor, S. T., & Weschler, C. J. (2011). Ventilation rates and health: Multidisciplinary review of the scientific literature. *Indoor Air*, 21(3), 191–204. <https://doi.org/10.1111/j.1600-0668.2010.00703.x>
- Sze To, G. N., & Chao, C. Y. H. (2010). Review and comparison between the Wells-Riley and dose-response approaches to risk assessment of infectious respiratory diseases. *Indoor Air*, 20(1), 2–16. PubMed. <https://doi.org/10.1111/j.1600-0668.2009.00621.x>
- Tang, J. W. (2009). The effect of environmental parameters on the survival of airborne infectious agents. *Journal of the Royal Society Interface*, 6(suppl_6), S737–S746.
- Tomisa, G., Horváth, A., Farkas, Á., Nagy, A., Kis, E., & Tamási, L. (2021). Real-life measurement of size-fractionated aerosol concentration in a plethysmography box during the COVID-19 pandemic and

- estimation of the associated viral load. *Journal of Hospital Infection*, 118, 7–14.
<https://doi.org/10.1016/j.jhin.2021.08.025>
- Underwriters Laboratories Inc. (2020). *Environmental Claim Validation Procedure (ECVP) for Zero Ozone Emissions from Air Cleaners, UL 2998 Third Edition*.
- Wang, C. C., Prather, K. A., Sznitman, J., Jimenez, J. L., Lakdawala, S. S., Tufekci, Z., & Marr, L. C. (2021). Airborne transmission of respiratory viruses. *Science*. <https://doi.org/10.1126/science.abd9149>
- Weber, D. J., Rutala, W. A., Anderson, D. J., Chen, L. F., Sickbert-Bennett, E. E., & Boyce, J. M. (2016). Effectiveness of ultraviolet devices and hydrogen peroxide systems for terminal room decontamination: Focus on clinical trials. *Disinfection, Sterilization and Antisepsis: Principles, Practices, Current Issues, New Research and New Technologies*, 44(5, Supplement), e77–e84.
<https://doi.org/10.1016/j.ajic.2015.11.015>
- Wells, W., Wells, M., & Wilder, T. (1942). The environmental control of epidemic contagion. I. *An Epidemiologic Study of Radiant Disinfection of Air in Day Schools Am J Hyg*, 35, 97–121.
- Whalen, J. J. (2009). *Environmental control for tuberculosis; basic upper-room ultraviolet germicidal irradiation guidelines for healthcare settings guide (cdc:5306)*. <https://stacks.cdc.gov/view/cdc/5306>
- Wong, T., Woznow, T., Petrie, M., Murzello, E., Muniak, A., Kadora, A., & Bryce, E. (2016). Postdischarge decontamination of MRSA, VRE, and Clostridium difficile isolation rooms using 2 commercially available automated ultraviolet-C-emitting devices. *American Journal of Infection Control*, 44(4), 416–420.
<https://doi.org/10.1016/j.ajic.2015.10.016>
- Woods, J., James, N., Kozubal, E., Bonnema, E., Brief, K., Voeller, L., & Rivest, J. (2022). Humidity's impact on greenhouse gas emissions from air conditioning. *Joule*, 6(4), 726–741.
<https://doi.org/10.1016/j.joule.2022.02.013>
- World Health Organisation Staff & World Health Organization. (2004). *Laboratory Biosafety Manual*. World Health Organization.
- World Health Organization. (2014). *Infection prevention and control of epidemic-and pandemic-prone acute respiratory infections in health care*. World Health Organization.
- World Health Organization. (2021). *Roadmap to improve and ensure good indoor ventilation in the context of COVID-19*.
- Yang, J., Sekhar, C., Cheong, D. K. W., & Raphael, B. (2015). A time-based analysis of the personalized exhaust system for airborne infection control in healthcare settings. *Science and Technology for the Built Environment*, 21(2), 172–178. <https://doi.org/10.1080/10789669.2014.976511>
- Yang, J., Sekhar, C., Cheong, K. W. D., & Raphael, B. (2014). Performance Evaluation of a Novel Personalized Ventilation – Personalized Exhaust System for Airborne Infection Control. *Indoor Air*, 25.
<https://doi.org/10.1111/ina.12127>
- Yang Junjing, Sekhar, C., Cheong, D., & Raphael, B. (2014). Performance evaluation of an integrated Personalized Ventilation–Personalized Exhaust system in conjunction with two background ventilation systems. *Building and Environment*, 78, 103–110. <https://doi.org/10.1016/j.buildenv.2014.04.015>
- Yang, J., Sekhar, C., Wai, D. C. K., & Raphael, B. (2013). Computational fluid dynamics study and evaluation of different personalized exhaust devices. *HVAC&R Research*, 19(8), 934–946.
<https://doi.org/10.1080/10789669.2013.826066>
- Yang, W., & Marr, L. C. (2011). Dynamics of Airborne Influenza A Viruses Indoors and Dependence on Humidity. *PLOS ONE*, 6(6), e21481. <https://doi.org/10.1371/journal.pone.0021481>
- Ye, Q., Krechmer, J. E., Shutter, J. D., Barber, V. P., Li, Y., Helstrom, E., Franco, L. J., Cox, J. L., Hrdina, A. I. H., Goss, M. B., Tahsini, N., Canagaratna, M., Keutsch, F. N., & Kroll, J. H. (2021). Real-Time Laboratory Measurements of VOC Emissions, Removal Rates, and Byproduct Formation from Consumer-Grade Oxidation-Based Air Cleaners. *Environmental Science & Technology Letters*, 8(12), 1020–1025.
<https://doi.org/10.1021/acs.estlett.1c00773>
- Yousuf, M. I. (2007). Using expert opinions through Delphi technique. *Practical Assessment, Research, and Evaluation*, 12(1), 4.

- Zhang, H., Srinivasan, R., & Ganesan, V. (2021). Low Cost, Multi-Pollutant Sensing System Using Raspberry Pi for Indoor Air Quality Monitoring. *Sustainability*, *13*(1). <https://doi.org/10.3390/su13010370>
- Zivelonghi, A., & Lai, M. (2021). Mitigating aerosol infection risk in school buildings: The role of natural ventilation, volume, occupancy and CO2 monitoring. *Building and Environment*, *204*, 108139. <https://doi.org/10.1016/j.buildenv.2021.108139>

DOCUMENT REVISION COMMITTEE ROSTER

*The ASHRAE Position Document on Infectious Aerosols was developed by the Society's Position Document Revision Committee formed on **Date (Month, day, year)**, with Walt Vernon as its chair.*

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DOCUMENT HISTORY

The following summarizes the revision, reaffirmation, or withdrawal dates:

6/24/2009—BOD approves Position Document titled *Airborne Infectious Diseases*

1/25/2012—Technology Council approves reaffirmation of Position Document titled *Airborne Infectious Diseases*

1/19/2014—BOD approves revised Position Document titled *Airborne Infectious Diseases*

1/31/2017—Technology Council approves reaffirmation of Position Document titled *Airborne Infectious Diseases*

2/5/2020—Technology Council approves reaffirmation of Position Document titled *Airborne Infectious Diseases*

4/14/2020—BOD approves revised Position Document titled *Infectious Aerosols*

xx/xx/2022—BOD approves revised Position Document titled *Infectious Aerosols*



MINUTES

BOARD OF DIRECTORS MEETING

Tuesday, December 6, 2022

Note: These draft minutes have not been approved and are not the official record until approved by the Board of Directors.

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Board of Directors Meeting

Tuesday, December 6, 2022

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PRINCIPAL APPROVED MOTIONS

Board of Directors Meeting

Tuesday, December 6, 2022

No. - Pg.	Motion
1 - 2	Finance Committee recommends to the Board of Directors (BOD) a proposed dues increase in Society Year 2023-2024 to \$260 for Full Members and includes all other membership dues grades that are calculated based on a percentage of Full Member dues, except Developing Economy Member dues will not increase and will remain at \$155. Refer to ATTACHMENT A which outlines the recommended Fiscal Year 2023-2024 dues by membership grade.
2 - 7	ASHRAE develop a non-ANSI standard to mitigate the risk of respiratory pathogens in buildings as defined in ATTACHMENT B.



MINUTES

BOARD OF DIRECTORS MEETING

Tuesday, December 6, 2022

MEMBERS PRESENT:

Farooq Mehboob, President
Ginger Scoggins, President-Elect
Billy Austin, Vice President
Dunstan Macauley, Vice President
Sarah Maston, Vice President
Ashish Rakheja, Vice President
Jeff Littleton, Secretary
Steven Sill, Region I DRC
Ronald Gagnon, Region II DRC
Mark Tome, Region III DRC
Bryan Holcomb, Region IV DRC
Jim Arnold, Region V DRC
Susanna Hanson, Region VI DRC
Chris Gray, Region VII DRC
Randy Schrecengost, Region VIII DRC

Tyler Glesne, Region IX DRC
Devin Abellon, Region X DRC
Eileen Jensen, Region XI DRC
John Constantinide, Region XII DRC
Cheng Wee Leong, Region XIII DRC
Andres Sepulveda, Region XIV DRC
Richie Mittal, RAL DRC
Blake Ellis, DAL
Luke Leung, DAL
Wei Sun, DAL
Dru Crawley, DAL
Ken Fulk, DAL
Art Giesler, DAL
Wade Conlan, DAL
Kishor Khankari, DAL
Adrienne Thomle, DAL

GUESTS PRESENT:

Bill Bahnfleth
Bryan Holcomb
Glenn Brinckman
Kevin Boyle
Mark Drozdov

STAFF PRESENT:

Candace DeVaughn, Manager - Board Services
Chandrias Jolly, Assistant Manager - Board Services
Joyce Abrams, Director - Member Services
Vanita Gupta, Director - Marketing
Kim Mitchell, Chief Development Officer
Mark Owen, Director - Publications & Education
Stephanie Reiniche, Director - Technology
Alice Yates, Director - Government Affairs
Craig Wright, Director of Finance

CALL TO ORDER

Mr. Mehboob called the meeting to order at 8:01 am.

CODE OF ETHICS

Mr. Mehboob read the code of ethics statement and advised that the full code of ethics statement and core values were available online.

ROLL CALL/INTRODUCTIONS

Roll call was conducted. Members, staff, and guests in attendance as noted above.

REVIEW OF MEETING AGENDA

Mr. Mehboob advised that all open session items would be discussed before open session. There were no other changes or additions.

SY2023-24 DUES

Ms. Scoggins moved that

1. Finance Committee recommends to the Board of Directors (BOD) a proposed dues increase in Society Year 2023-2024 to \$260 for Full Members and includes all other membership dues grades that are calculated based on a percentage of Full Member dues, except Developing Economy Member dues will not increase and will remain at \$155. Refer to ATTACHMENT A which outlines the recommended Fiscal Year 2023-2024 dues by membership grade.

The background was shown on screen and was included in the meeting agenda.

Ms. Scoggins reported that the BOD heard at the Istanbul meeting about the struggles with developing economies. If approved, developing economies dues would remain unchanged.

She reported that the Finance Committee spent some time on the formula.

Mr. Mehboob reported that the Finance Committee will study the matter further and come up with a rational methodology for developing economies' dues. In the meantime, the proposal is to freeze dues until work can be done.

The floor was opened for discussion.

Mr. Khankari stated that he was undecided on the motion. He stated that the only justification he saw for increasing dues is because the formula says so.

Mr. Glesne responded that Mr. Khankari's interpretation of the motion was an incomplete analysis. The BOD already discussed the budget at length. The more current assignment was to review dues and determine what needs to be done as it relates to dues. The BOD would have to go back to the previous budget discussion to get that level of detail.

MOTION 1 PASSED (Unanimous Voice Vote, CNV).

PROPOSED FAST-TRACKED IEQ RESPIRATORY PATHOGEN STANDARD

Mr. Mehboob informed the BOD that Society received an invitation, through the Washington office, to speak to the COVID White House response team. He felt it would be appropriate to have a diverse set of people on the call. The pre-call meeting was with Mr. Bahnfleth, Mr. Knight, Mr. Mehboob, Mr. Littleton, Mr. Wentz, and Ms. Yates. Ms. Yates provided background to the group and helped to prepare Society's positions.

He reported that the group had a very comfortable call. Following the call, the ASHRAE team had a post-call session. The team felt that much of what would go into the standard is work that has already been done by the ETF. It would be a much-reduced effort where Society is repackaging some of the information that Society already has.

The group produced a response letter, which was shown on screen.

Mr. Littleton reported that members of the White House Science and Technology team, along with Dr. Jha, celebrated that ASHRAE is a leader and acknowledged the great work that ETF has done. In that context, the group asked what Society was doing in respect to pathogen mitigation. The ASHRAE group did not have a really good answer and the conversation underscored that this is a pivotal moment in history for ASHRAE.

Society has been talking about the importance of pathogen mitigation standards for the past several years. Unfortunately, the ANSI process is slow, which makes it difficult to respond quickly to environmental conditions and market demand for a pathogen mitigation standard. Society has already done the work; what is needed now is to reframe technical guidance into a standard that can be adopted by jurisdictions and move the needle.

Having a non-ANSI standard is not uncommon, AHRI does it. The reason to create a non-ANSI standard would be speed. The proposed process would mirror what normally happens but within a compressed timeline. Society would create a consensus standard using a balanced committee, just on a tighter timeline than the ANSI process allows for.

Mr. Littleton encouraged the BOD to not let the perfection driven by the ANSI process get in the way of the practical need to develop a standard that will assist jurisdictions in addressing the clear and present danger that pathogens represent. This is a moment for ASHRAE. He humbly suggested that the mission centric need for ASHRAE to respond with an adoptable standard is just as important, if not more so, than Society's response to the energy crisis in the past.

This is important for Society and would serve it well. The proposed is a fresh and different approach that would not be without criticism. However, the approach allows Society to respond quickly to a clear mission centric market demand. This work can minimize risk in the built environment. Ideally, the non-ANSI standard would be a feeder where the majority of the information would, eventually, end up in an existing standard.

Mr. Littleton reported that the fiscal impact of the proposed motion includes hiring staff to expedite the process.

Mr. Mehboob stated that if Society is able to do this, it would have a certain application around the world. Doing so would help to raise the Society's profile.

He reported that the group made it clear to the White House team that ASHRAE is governed by a BOD. He stated that the wisdom of the BOD is needed to guide this decision. He opened the floor to comments. A summary of that discussion is below:

(Scoggins) Mixed on this. Is there any cost benefit analysis that has been done? Is the White House willing to help fund this in any manner? Any revenue anticipated? Concerned with the liability of doing a standard that is not ANSI based.

(Mehboob) Good and pertinent comments. Had exactly the same idea about costs. The group did not specifically say this to the White House, but the idea was seeded, as it was stated that this would be an expensive enterprise. Revenue analysis has not been done at this point. Think there will be revenue but do not know what that will be at this point; the group feels the standard would sell itself.

(Littleton) The White House can't fund something like this directly and they are very sensitive about directing Society to do this. It is a very thin political line. Possible that Society could go to agencies to find funding, but right now there is no specific vision for funding from the government.

The fiscal impact is high and was meant to provide a worst-case scenario to the BOD. There would definitely be sales revenue that would be available within six months. But it is a challenging question to estimate revenue.

(Yates) With relation to the revenue question, this is not a partnership with the White House. The White House has hosted activities that will essentially do the marketing for this. The response to the ETF is indication of the great interest of the market demand coming from jurisdictions. There is a demand for this.

(Mehboob) Does Europe have a pathogen mitigation standard?

(Sepulveda) Do not have as such. The proposed standard would be a help to Europe as well.

(Mehboob) Would be a global first for Society.

(Constantinide) Does the government want a standard or code language? Focusing on code language would help with liability and speed up the process. In favor of the path that we are going but would speak in favor of using code language.

(Littleton) My understanding is that the standard would be written in mandatory code language that is written for adoption by jurisdictions.

(Arnold) In favor. Have concerns regarding budget and how those funds will be recouped.

(Khankari) Feels good that the ASHRAE brand is being recognized. Thanks to all that worked on this. Several concerns – Who is going to buy this standard? If we can develop a standard for pathogen mitigation, we deserve a Noble Prize. Society is not in the business of pathogen mitigation. Are we addressing IAQ or pathogen mitigation? Why does the White House have to tell us to do this if the ETF has done such a good job? Why didn't this suggestion come from Society? Maybe we are still lagging on our strategic thinking. Lastly, would we be setting a precedent? Where is this going to end? Should we be following what politicians tell us to do?

(Littleton) Want to emphasize that the White House is not asking us to do this. The White House conversation has underscored for the ASHRAE team that this is a mission centric item to serve the public and accomplish our mission. Just suffered one of the worst pandemics in history and we need to respond to that. If Society doesn't do this, another organization will. Society could decide to do this or relegate the task to another body as yet to be determined.

(Yates) Appreciate Mr. Khankari's points. The White House came to us because they know we are the experts. Really looking to us, not asking us to do this; important distinction because if they were asking us to do this it would require a public bid. The ASHRAE team just had a conversation with Dr. Jha because the White House has finally included buildings in their COVID responses. The White House has begun acknowledging how important IAQ and clean air are and they are looking to the experts. Looking to ASHRAE because public health experts are not building experts.

(Khankari) Pathogen mitigation and IAQ are two different things. We are not pathogen mitigation experts. Clarified his previous point asking why Society wasn't already working to create a standard focused on IAQ to reduce the risk of pathogen transmission. Not speaking against the recommendation.

(Mehboob) Our mission is to have healthy and sustainable indoor environment for all. No one is paying us for ETF guidance because that is who we are, we are here to serve humanity. Standards are meant to fill a gap and serve humanity.

(Sun) It is very critical for ASHRAE to enhance its importance in this field; especially for better IAQ to reduce airborne transmission. Not a typical research topic with a narrow focus. Could make a positive impact on the U.S. and globally. Important that we start with standard rather than code language. Time is of the essence, if Society doesn't do this other professional organizations will stand in the gap.

(Thomle) Agree with Mr. Constantinide. Mr. Sun has a great idea to use standard language first. Concerned that the White House may be approaching other organizations. If multiple organizations rush to create this standard, which one will the White House accept? Fooling ourselves that we will get payback in two to three years. Do think we need to do this because we have to be the leader in our industry.

(Yates) Can confirm that the White House is talking to other organizations. Don't know the full list but they have spoken to ANSI and the Harvard Healthy Buildings Institute.

(Hanson) The issue is so important, almost don't care about the payback at this point. If we did something like this that came out as fast as proposed, what are we getting rid of? Does that mean that we aren't going to file the PINS? Can we come back to have it ANSI approved? What exactly are we relaxing? The pandemic highlighted that we've allowed IAQ to languish. Can we put more effort and emphasis on putting more parts of our standards into codes?

(Reiniche) Haven't defined exactly how this will run. Wouldn't file a PINS, the process would happen outside of that. Once the document is complete it would be submitted through the ANSI process; to avoid confusion advise doing it separately.

Not a lot of teeth to ANSI's conflict duplication. ANSI doesn't write standards; they just enforce the rules. Hoping that since the White House reached out, that ASHRAE is at the top of their list to develop something like this.

(Macauley) In favor of this recommendation. We've talked about speed to market and this is an opportunity that has been presented to us and we need to act. There is high demand around the world. Opportunity to change our paradigm and how we can market products. Can use this as a test case. This is the result of the Government Affairs activities we have been doing. Need to respond quickly, otherwise, everything we have been working on is for not.

We've been given an opportunity to develop a product that has a showcase. That is better than most of our standards that we currently have on the market. Need to take advantage of this. The work has been done by the ETF. Let's look at this from a big picture perspective. Need to move forward and turn it over to Ms. Reiniche's team to work out the details.

(Fulk) Generally in favor of this. Intent is that this would be an international standard, hope that we would have proper international representation. Think we may have some information that already resides in ASHRAE. Have some concerns about the standard not being ANSI based but these concerns have been answered. Biggest concern is that the government is asking us to do this and then asking us to pay for it. Think the government should help share this cost. Suggest reaching out to other entities to see if we can get other partners to share the cost of this. Believe the revenue stream will fall well short of the cost to develop this standard. Do not feel there will be any payback based on the cost on the table right now.

(Mitchell) This is exactly the kind of thing that Development should be raising funds for. If the motion is approved as stated, makes it harder to sell this to private foundations because they want to believe that they make the difference in whether things happen or not. It would be preferable if the motion indicated that this were contingent based on fundraising; otherwise, it makes it more difficult to raise money. May take us a while because of the funding cycles of foundations, anywhere from two to six months.

(Mehboob) Can we concurrently raise money while working on the standard?

(Littleton) The ETF did a lot of work in advance and then sponsorship dollars came in. Believe we can start work while Development looks for funding.

(Mittal) In favor of the recommendation. Believe this could be an international global standard.

(Maston) In favor of this recommendation. Would like to piggyback on what Mr. Macauley said. Would be beneficial to go back and see exactly what the expectation is, take that information and make a global standard. Most of our standards don't make money and don't understand why this should be held to a different standard. Need to put our money where our mouth is as we keep talking about being market focused.

(Leung) This is about leadership and relationship. Different groups are discussing developing this standard. Suggest going back to the White House and recommending that Society work with others, so as not to confuse the public with multiple standards. Hope that Mr. Bahnfleth will be involved in this process.

(Conlan) This presents a global positioning of ASHRAE that we need to take advantage of. On the ETF this sort of thing was talked about quite a bit, but the group was focused on getting information out to people. We can take this opportunity to look at this from a holistic standpoint. Unique moment to advance IEQ where Society can be the leader. This document could be step one. Could get to the point where we are creating model IEQ codes for the world. Tools that support this and new tools created would be using ASHRAE IAQ tools.

(Khankari) After listening to the comments, strongly in favor of the motion. The infectious aerosols PD addresses all aspects of this potential standard. In addition to the work of the ETF, do not think we will need the full fiscal impact as all of the work has already been done by volunteers. Suggest that marketing be done at the same time we are developing this topic.

(Mehboob) The proposed motion should ask the BOD to proceed down this path, do not feel that 'expedite' be included as we are not currently doing this.

(Littleton) Good point. 'Expedite' was included because of the fiscal impact.

Ms. Scoggins moved and Mr. Macauley seconded that

2. ASHRAE develop a non-ANSI standard to mitigate the risk of respiratory pathogens in buildings as defined in ATTACHMENT B.

Attachment B was included in the meeting agenda and shown on screen.

Ms. Mitchell stated that it would still be helpful to include language about contingent funds from other sources.

Mr. Mehboob responded that he felt that the proposed language could be in the background but that it doesn't need to be in the body of the motion. Suggest adding a line to the background so that the motion doesn't need to be changed.

Ms. Scoggins expressed agreement. She stated that the fiscal impact does not state where the funds will come from.

MOTION 2 PASSED (Unanimous Voice Vote, CNV).

Mr. Mehboob stated that the BOD had a fantastic discussion and have taken up a great decision for ASHRAE.

EXECUTIVE SESSION

Executive session was called at 9:30 am.

Open session reconvened at 12:07 pm.

ADJOURNMENT

The meeting adjourned at 12:07 pm.

A handwritten signature in black ink, appearing to be 'JH Littleton', with a horizontal line extending to the right.

Jeff H. Littleton, Secretary

ATTACHMENTS:

- A. Recommended FY 2023-24 Dues by Membership Grade
- B. Developing a National Indoor Air Quality Standard to Mitigate the Risk from Respiratory Pathogens
- C. WebEx Chat Log

Membership Dues

	FY 2022-23 (Current)		FY 2023-24 (Calculated)	
<u>Full/Associate/Fellow Grade</u>				
Regular	\$ 240	\$	260	
Developing Economy	\$ 155	\$	155	Frozen for FY23-24 (Not Calculated)
<u>Affiliate Grade</u>				
Regular				
Year 1	\$ 60	\$	65	25.0% of Full Member Dues
Year 2	\$ 90	\$	100	37.5% of Full Member Dues
Year 3	\$ 120	\$	130	50.0% of Full Member Dues
Developing Economy				
Year 1	\$ 40	\$	40	25.0% of Dev. Eco. Member Dues
Year 2	\$ 60	\$	60	37.5% of Dev. Eco. Member Dues
Year 3	\$ 80	\$	80	50.0% of Dev. Eco. Member Dues
<u>Student Grade</u>				
Regular	\$ 25	\$	25	10.0% of Full Member Dues
Developing Economy	\$ 15	\$	15	50.0% of Student Member Dues
<u>Student Transfer Program (SmartStart)</u>				
Regular				
Year 1	\$ 25	\$	25	100.0% of Student Member Dues
Year 2	\$ 90	\$	100	37.5% of Full Member Dues
Year 3	\$ 120	\$	130	50.0% of Full Member Dues
Developing Economy				
Year 1	\$ 15	\$	15	100.0% of DE Student Grade Member Dues
Year 2	\$ 60	\$	60	37.5% of Dev. Eco. Member Dues
Year 3	\$ 80	\$	80	50.0% of Dev. Eco. Member Dues
<u>Retired</u>				
Regular	\$ 35	\$	40	15.0% of Full Member Dues
Developing Economy	\$ 20	\$	20	50.0% of Retired Member Dues
Life	\$ -			

**Rounded up/down to closest 0 or 5

Developing a National Indoor Air Quality Standard to Mitigate the Risk from Respiratory Pathogens

November 18, 2022

Scope

Delivery of a comprehensive, consensus-based, code enforceable National Indoor Air Quality Standard to Mitigate the Risk from Respiratory Pathogens. The standard will include:

- Both design and operation;
- Alternative paths (prescriptive or performance), in which equivalent clean air would be the goal; and
- Testing, verification, documentation (commissioning) and periodic re-commissioning.

Methodology

ASHRAE will set up a balanced team of internationally recognized experts to work on an accelerated timeline to develop the standard.

ASHRAE will develop a detailed title, purpose, and scope of the standard.

ASHRAE will seek input from a variety of stakeholders, including those with expertise from the federal government such as the White House Covid Response Team, the White House Office of Science and Technology Policy, Centers for Disease Control and Prevention, U.S. Environmental Protection Agency, National Institute of Standards and Technology, and the National Laboratories.

Timeline

The overall timeline for delivery of the IAQ standard is estimated to be **6 months** from the date of commencement, with an aggressive push to deliver by March 31. The following is a high-level breakdown of key deliverables:

- Detailed title, purpose, and scope: 15 days.
- Draft standard for peer review: within 90 days.
- Peer review period: 14 days
- Address peer review comments and submit for final publication: 45 days.

Incorporation of Pathogen Mitigation into ANSI Standards 62.1 and 62.2

In coordination with the pathogen mitigation standard development effort, ASHRAE will work to incorporate similar provisions into existing ASHRAE IAQ standards.

Options Post Development

ASHRAE could develop additional resources supplemental to the IAQ standard:

- Education and Training
- Design Application Guidance
- Operations and Maintenance Resources
- Other Resources

ATTACHMENT C

- December 6, 2022 7:48 AM from Adrienne T to everyone: Good morning and good evening!
- December 6, 2022 8:07 AM from Tyler Glesne to everyone:I can't unmute but i'm here
- December 6, 2022 8:07 AM from Tyler Glesne to everyone:might need permission
- December 6, 2022 8:27 AM from Mitchell, Kim to everyone: We can send out some proposals to foundations and corporate partners to try to raise this money. However, foundations may take a while to make decisions.
- December 6, 2022 8:28 AM from Mitchell, Kim to everyone: For the record, I am talking about the cost for developing the standard for pathogen mitigation within 6 months.
- December 6, 2022 8:30 AM from Mitchell, Kim to everyone: It could be helpful when approaching foundations if any money approved by ASHRAE were contingent upon not raising the money or all of the money. If it is approved up front, that may make it harder to "sell" the request.
- December 6, 2022 8:35 AM from Mark Owen to everyone: If Standard 188 is an analog, ballpark annual revenue has averaged \$30k-\$35k.
- December 6, 2022 8:39 AM from Eileen Jensen to everyone: The dues increase we just passed will cover the estimated cost - just an observation.
- December 6, 2022 8:40 AM from Ginger Scoggins to everyone: Good thought, Eileen!
- December 6, 2022 8:40 AM from John Constantinide to everyone: Agreed!
- December 6, 2022 8:49 AM from Ginger Scoggins to everyone: Many of our competitors are developing "standards" that are not ANSI based and are kicking our butts in terms of speed-to-market. I agree if we don't do it someone else will.
- December 6, 2022 8:54 AM from Bill Bahnfleth to everyone: This is a case of "needing to be in that room" to quote Tim Wentz. The public wants guidance - whether it is called a standard or something else. Who would we rather have develop that, taking into consideration all of the other considerations of cost, energy use, etc. that apply. Currently, ventilation recommendations are being made by people who know very little about buildings or the construction industry. This is a unique moment for advancing IAQ. Addressing the demand for guidance on infection risk mitigation is a foot in the door for a much bigger opportunity to have national model IAQ codes, which could be ASHRAE's existing IAQ standards.
- December 6, 2022 8:54 AM from Reiniche, Stephanie to everyone: ANSI doesn't write standards but would likely provide names of organizations that have the scope that might cover the topic. I would hope they would put ASHRAE at the top of that list
- December 6, 2022 8:56 AM from Ron Gagnon to everyone:can we run a parralel path with ansi, and eventually get it ainski approved
- December 6, 2022 8:57 AM from Adrienne T to everyone: Good comment Ron.
- December 6, 2022 8:58 AM from Wei Sun to everyone: Good point, Ron.
- December 6, 2022 8:59 AM from John Constantinide to everyone: Something to keep in mind with federal agencies and funding, there is a strong trend to have more industry/private partnership with the federal government to do activities like these. I would not be surprised if the White House does not ultimately provide funding, but perhaps we can negotiate some soft benefits, such as recognition, promotion to jurisdictions through federal connections, etc., that can yield financial benefit to ASHRAE.

December 6, 2022 9:00 AM from Eileen Jensen to everyone: I agree John, very good point.

December 6, 2022 9:02 AM from Bill Bahnfleth to everyone: FYI, ETF generated direct donations of ~\$165K

December 6, 2022 9:03 AM from Wei Sun to everyone: Dunstan, thank you for your comment.

December 6, 2022 9:04 AM from Adrienne T to everyone: Thank you Bill, can we do it again? Raise funding?

December 6, 2022 9:04 AM from ANDRES to everyone: This is a great opportunity to listen to "Voice of Customer" (BOD Strategic focus). Let ´s respond YES we can do it

December 6, 2022 9:05 AM from Mark Owen to everyone: Be aware that funders may want to restrict our ability to copyright the content and earn revenue.

December 6, 2022 9:07 AM from Susanna Hanson to everyone: What Mark said. Let's have this be ASHRAE money and not funder money.

December 6, 2022 9:07 AM from Bill Bahnfleth to everyone: Adrienne, I do.

December 6, 2022 9:07 AM from Adrienne T to everyone: Thank you for the clarification Kim.

December 6, 2022 9:08 AM from Ken Fulk to everyone: One question that I have, out of curiosity, is whether the government has a specific goal in mind that they want this standard to say or address or do? It might be beneficial to get any specific input from them to be clear on expectations. Having said that I also think that we need to do what we believe is the right thing to do and not be pushed toward an expected answer.

December 6, 2022 9:10 AM from Wei Sun to everyone: Collectively, ASHRAE can do it, otherwise someone else could use the information developed by ASHRAE and package them into their product. This is not a typical research project, instead, the impact from this product is going to be much bigger.

December 6, 2022 9:11 AM from Yates, Alice to everyone: Thanks Ken for your great question! The Government wasn't asking for something specific; they wanted to know what ASHRAE is doing. The WH is pushing for good Indoor Air Quality. It's not more specific than that (which is part of the challenge!)

December 6, 2022 9:14 AM from John Constantinide to everyone: Wade's point on tools for codes is a good point. I think we can get more buy-in and funding, federal or otherwise, with developing the tools to enforce and comply with the code language developed.

December 6, 2022 9:15 AM from Wade Conlan to everyone: Thanks John. And the fund raising could towards those items in addition to this standard (non-ansi) document.

December 6, 2022 9:16 AM from Eileen Jensen to everyone: We need to build on the momentum from the ETF, which I believe is why the White House approached us in the first place. As others have noted, we have the expertise to look at this holistically and be the leaders in this.

December 6, 2022 9:16 AM from Wei Sun to everyone: Wade: Good summary.

December 6, 2022 9:20 AM from Tyler Glesne to everyone:break

December 6, 2022 9:20 AM from Bill Bahnfleth to all panelists: Ken - The main thing missing in ASHRAE guidance is a recommendation on ventilation rates. That alone would probably satisfy them, but we can do better.

December 6, 2022 9:37 AM from Art Giesler to everyone: Can we speed this up and do a consent

agenda for RMCR in the future?

December 6, 2022 9:38 AM from Billy Austin to everyone: i am having technical difficulties. Could someone please send me the link to poll everywhere? Thanks!

December 6, 2022 11:08 AM from Chris Gray to everyone: Chris is back

December 6, 2022 11:18 AM from Kishor Khankari AnSight LLC to everyone: Excellent job, Candace!

December 6, 2022 11:27 AM from Susanna Hanson (privately): I did not receive the communcation of this ethics yesterday. Please forward to my new work email address: susanna.hanson@honeywell.com

December 6, 2022 11:57 AM from Jim Arnold to everyone: I have a hard out at noon. I have a scope review.

December 6, 2022 12:02 PM from Richie Mittal to everyone: Thanks Candace and Chandrias for well conducted voting..

December 6, 2022 12:06 PM from Eileen Jensen to everyone: Agreed Richie - thank you Candace and Chandrias!

ACTION ITEMS

Board of Directors Meeting
Wednesday, June 29, 2022

No. - Pg.	Responsibility	Summary of Action	Status	Goal Date
1 – 14	Littleton	Ensure that future Standards and TPS motions include a fiscal impact for the BOD's consideration.	Complete	
2 – 20	Littleton	Investigate if there are any legal impediments to creating a WhatsApp Group for the BOD.	Complete	

ACTION ITEMS

Board of Directors Meeting

Monday, August 15, 2022

No. - Pg.	Responsibility	Summary of Action	Status	Goal Date
1 – 3	Littleton and Macauley	Adjust the payments to members analysis to indicate what portion of payments are reimbursement for travel.	Complete	

ACTION ITEMS

Board of Directors Meeting
October 13-14, 2022

No. - Pg.	Responsibility	Summary of Action	Status	Goal Date
1 – 9	Macauley	Investigate the possibility of developing regions specific ALI courses. Region specific courses would be developed by members outside of North America and presented by members from the regions where they were developed.		
2 – 11	Knight	Work with the Finance Committee to reevaluate the 65% of Full Member dues that is used to set the Developing Economy dues rate.		
3 – 13	Littleton	Take the documentation from the Global HVAC Summit and forward it to the TFBD ExCom. The TFBD will address relevant items from the summit in a future report.	Complete	



Financial Update

Board of Directors

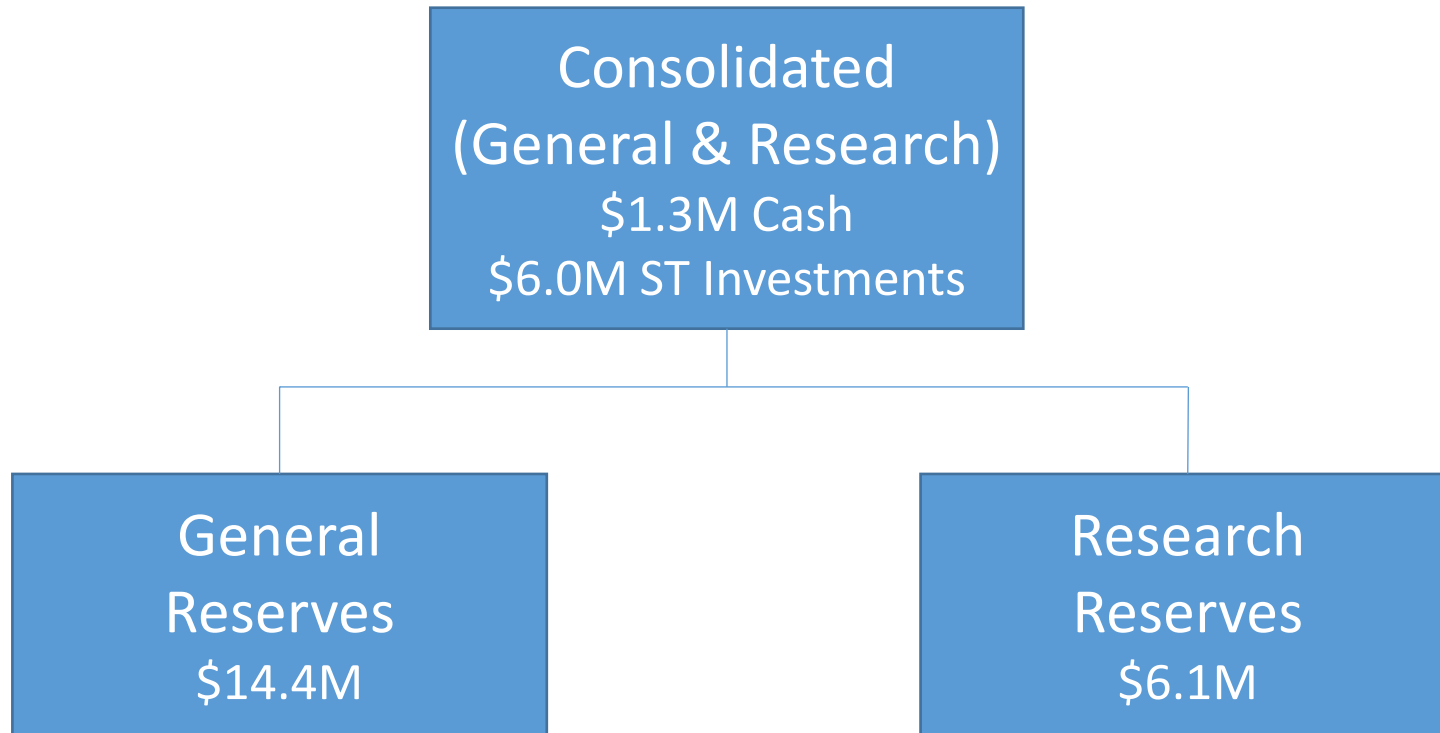
Dennis Knight, Treasurer
February 5, 2022
Winter Meeting – Atlanta

Financial Status

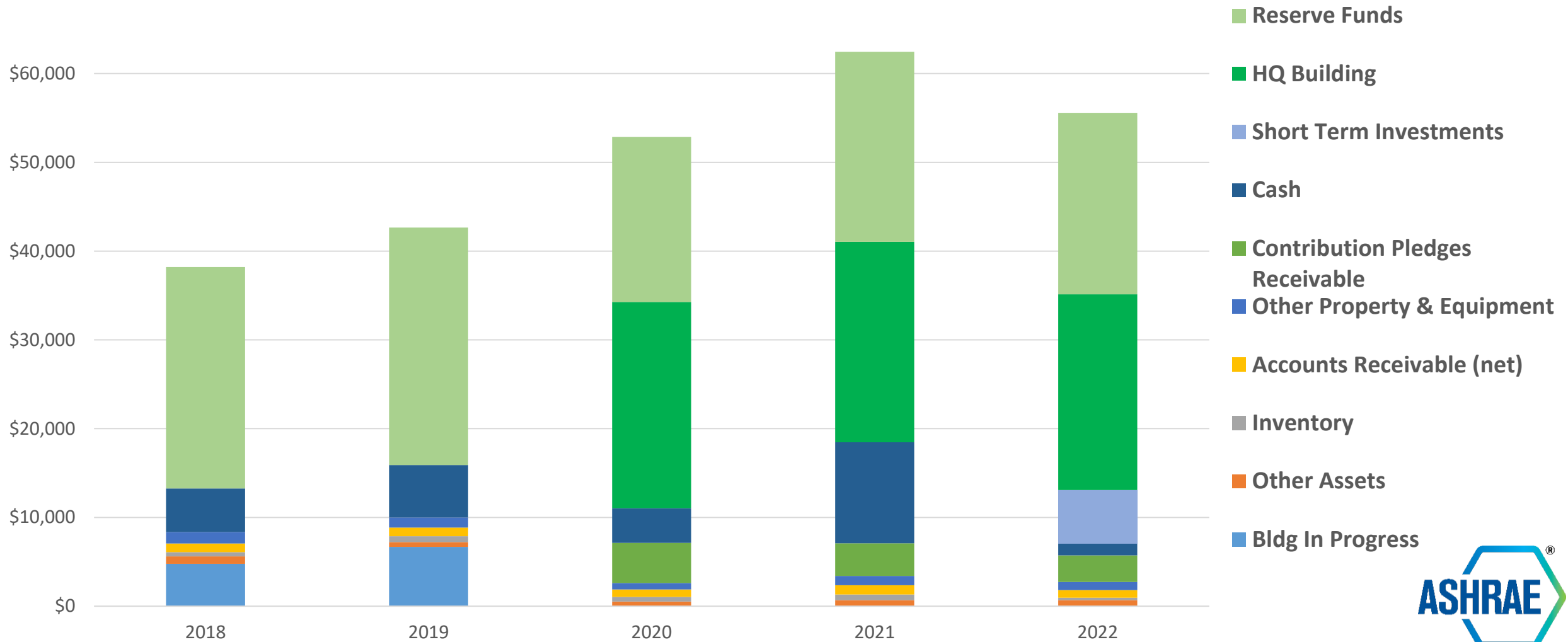
As of December 31, 2022



Fund Structure – as of 12/31/22

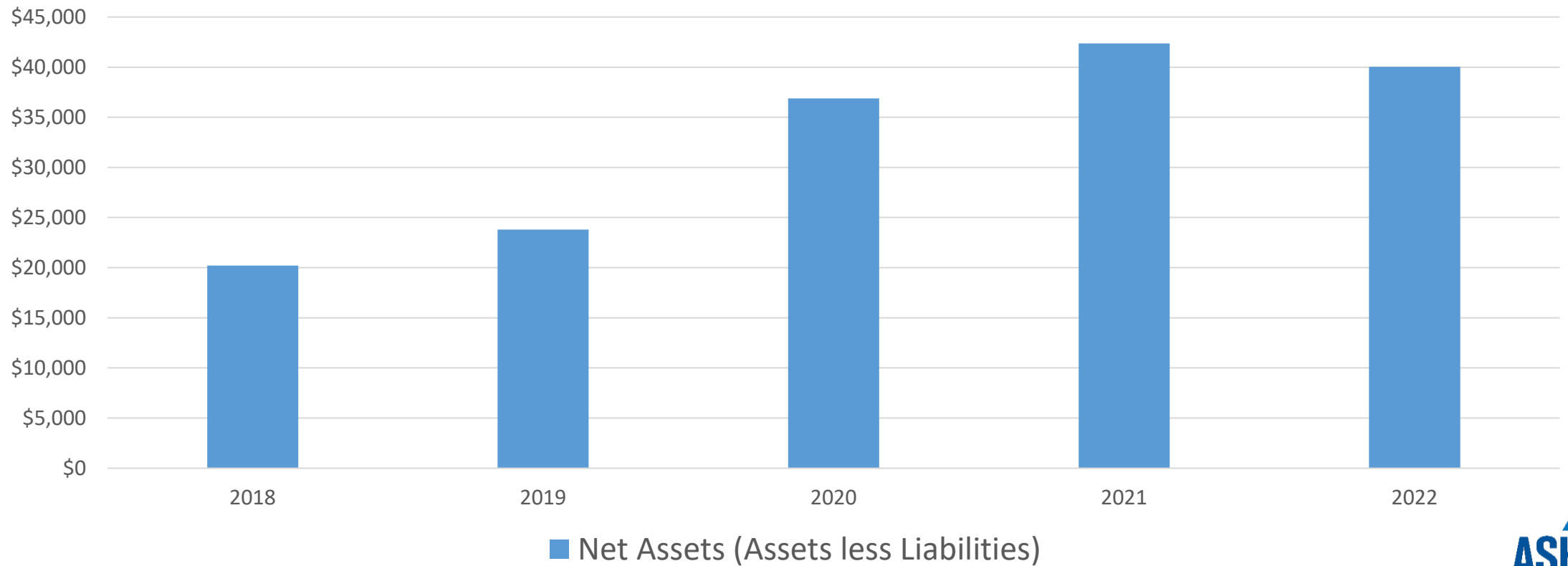


Consolidated Funds Composition of Assets As of December 31 (in Thousands)



Consolidated Funds Cumulative Net Assets As of December 31

(in Thousands)



General Fund Revenue and Expenses

Forecast vs. Budget
Society Year 2022-23

(in Thousands)		SY 22-23 Forecast	SY 22-23 Budget
Revenues		\$25,233.3	\$25,461.3
Expenses		\$25,353.7	\$25,490.4
Surplus/(Deficit)		(\$120.4)	(\$29.1)



Major Variations (Forecast vs. Budget)

Revenue - General Fund

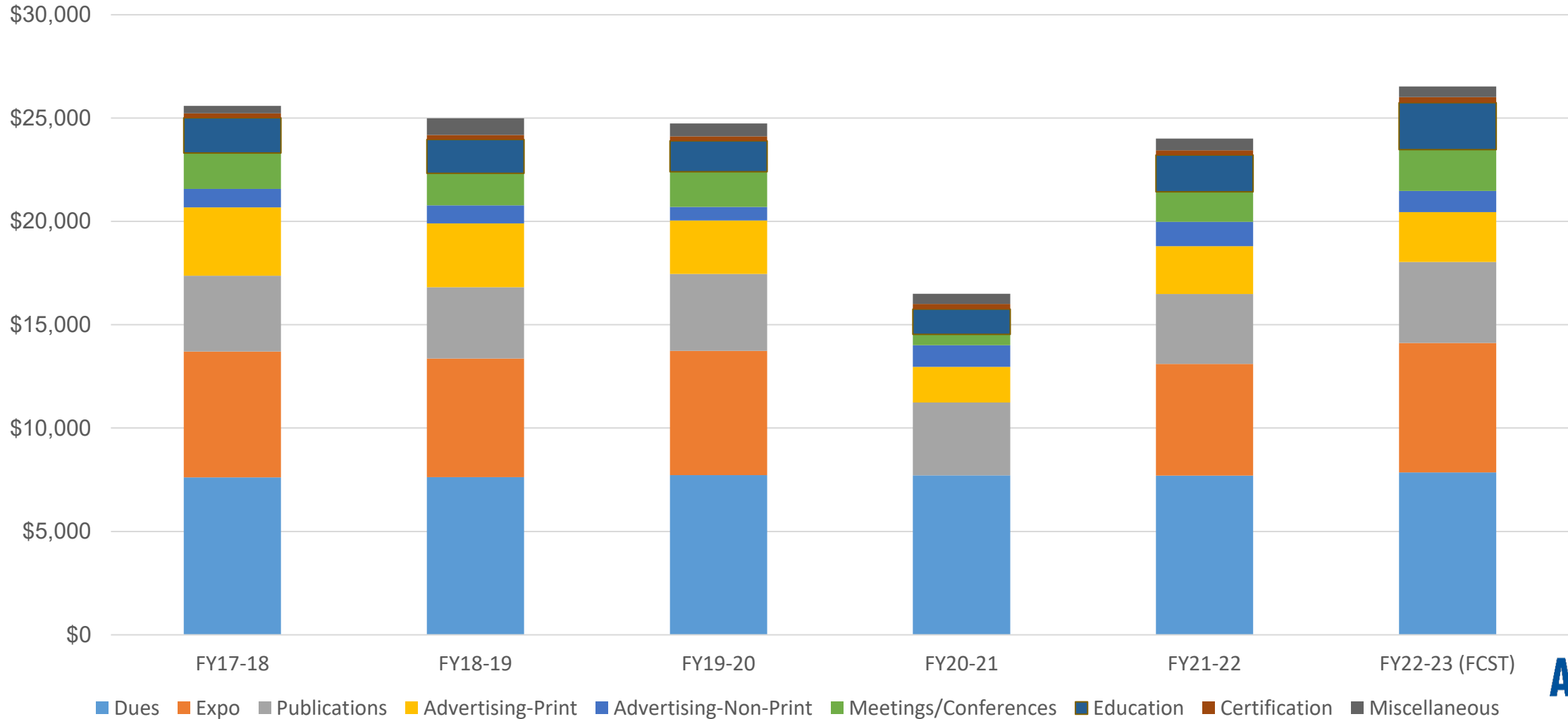
Forecast is Higher (Lower Than) Budget

- Publications \$95.0K or 2.5%
 - Newer publications are selling very well (Lucy's Eng. Adv., 62.1, 62.2, Prin. Of HVAC textbook) and ahead of budget YTD
- Advertising (Print/Non-Print) (\$357.2K) or 9.4%
 - Budget was aggressive (based primarily on last year's sales and finalized before large inflationary/recession pressures showing up) but signs of advertiser uncertainty about the economy in general is creating volatility in companies' approach and demand
- Meetings/Conferences (\$80.0K) or 3.9%
 - Virtual registrations MUCH lower than budgeted; First-time member registration rate revenue trailing budget - 130+ free registrations (new member benefit).
- Education \$150.0K or 7.1%
 - In-Company/Chapter trainings are 2X last year and significantly greater than budget offset slightly by forecasted sales lagging a bit at the Dubai GTC due to lingering effects of pandemic
- AHR Expo Royalty (\$140.0K) or 2.2%
 - Actual estimates - 488,000 NSF vs. 500,000 NSF used for budget.
- AHR Expo Mexico Royalty \$44.2K or 76.2%
 - Budget was based on 44,000 NSF; Actual results were 58,000 NSF.
- Miscellaneous Income \$60.0K or 13.1%
 - Interest Income was not budgeted for FY22-23 as short-term interest rates didn't go above 1% until late May 2022; YTD Interest Income - \$38K



Revenue Trends – General Fund

(in Thousands)



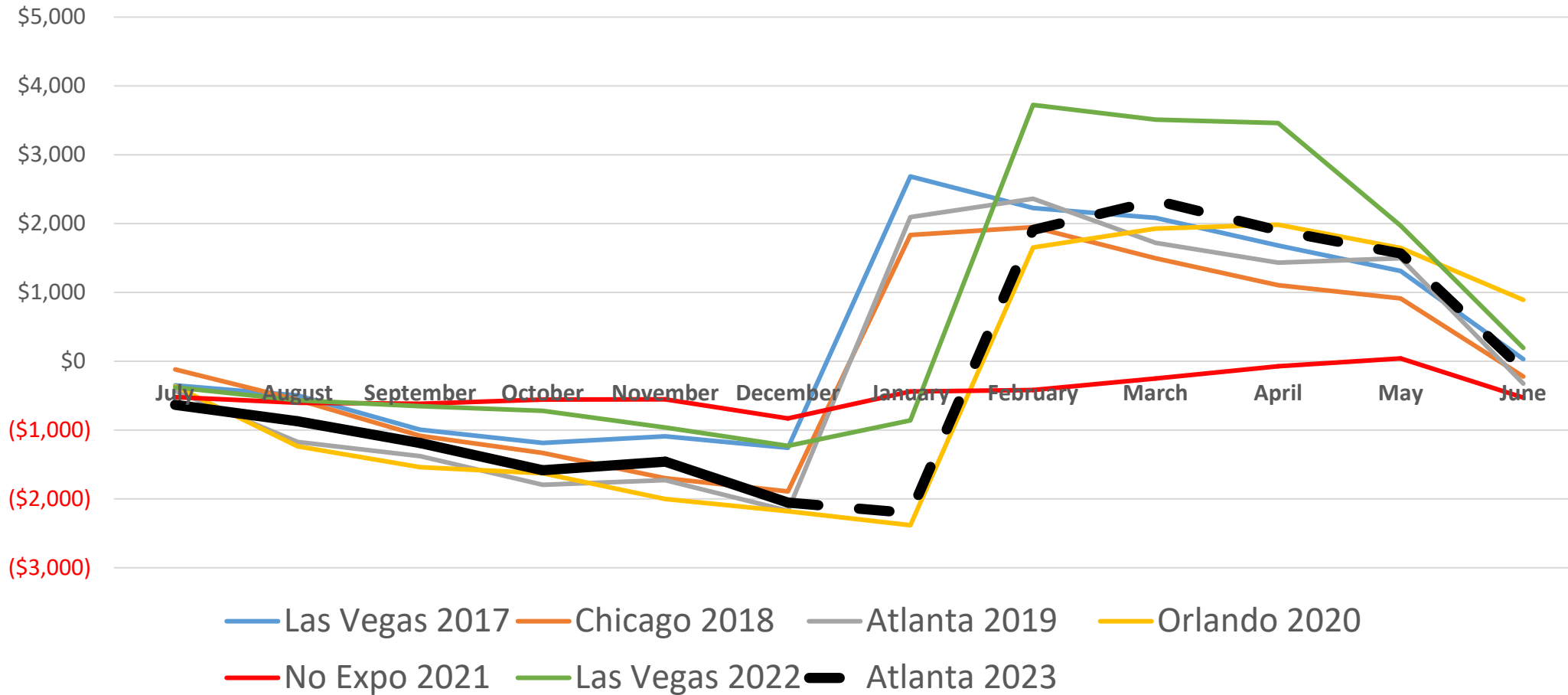
Major Variations (Forecast vs. Budget) Expenses - General Fund Forecast is Higher (Lower Than) Budget

- Publishing \$34.1K or 2.7%
 - Increase in forecasted sales of publications (higher publication costs)
- Promotion (\$47.7K) or 3.5%
 - Decrease in forecasted advertising income (lower sales commission expense).
- Education Courses/Trainings (\$148.8K) or 21.3%
 - YTD Actuals are trending lower than budget and fewer courses at Dubai GTC than budgeted in FY22-23



Cumulative Net Revenue and Expenses (General Fund)

(in Thousands)

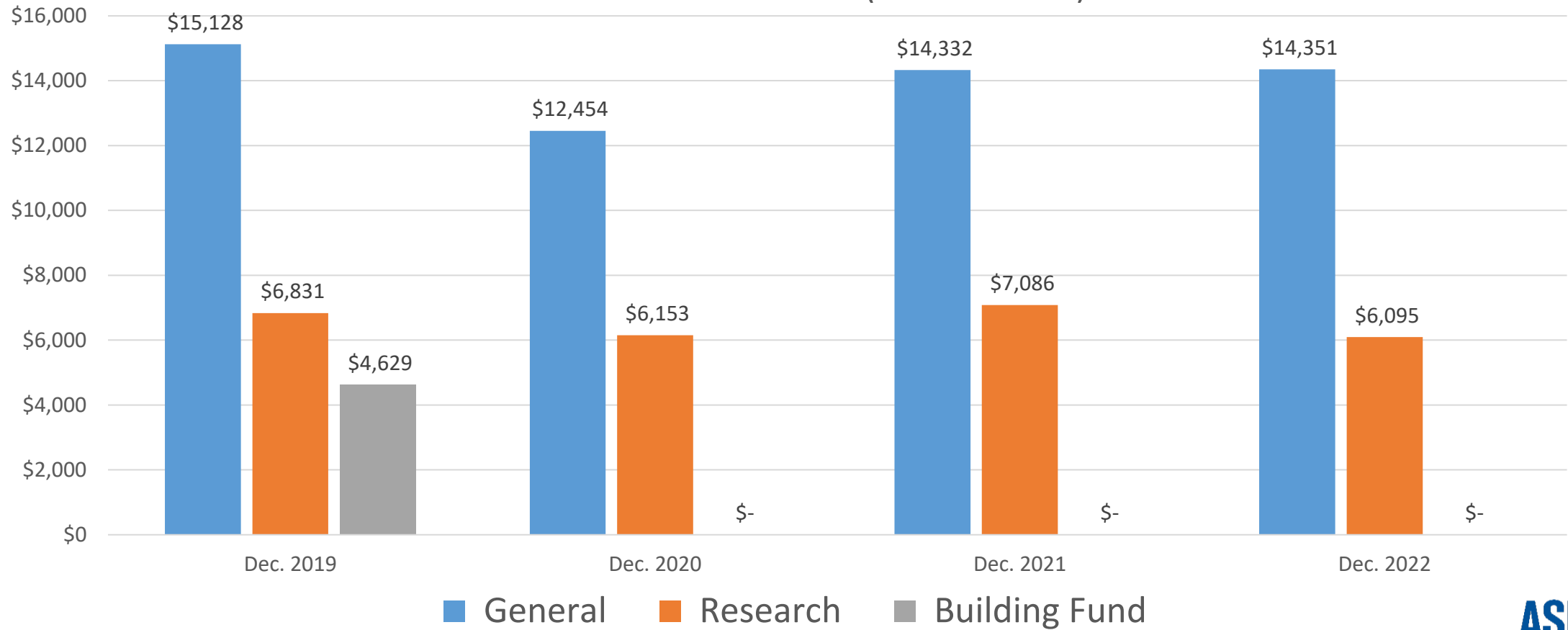


Investments



Investments

Reserve Fund Balances (in thousands)



Questions?



ASHRAE
Major Variations - FY22-FY23 Forecast vs. Budget
General Fund

BOD OPEN SESSION AGENDA SUNDAY 2023 FEB. 5

	12 Months Ended		Difference		
	Forecast FY 2023	Budget FY 2023	\$	%	
REVENUES					
31 Membership Dues	\$7,858.5	\$7,858.5	-	0.0%	Actual YTD results are tracking to budget
32 Publication Sales	3,914.7	3,819.7	95.0	2.5%	Newer Publications are selling very well (Lucy's Engineering Adv., 62.1, 62.2, Principles of HVAC textbook) and ahead of budget
34 Advertising Income - Print	2,411.8	2,524.0	(112.2)	-4.4%	Budget was aggressive (based primarily on last year's sales and finalized before large inflationary/recession pressures showing up) but signs of advertiser uncertainty about the economy in general is creating volatility in companies' approach and demand
34 Advertising Income - Non-Print	1,030.0	1,275.0	(245.0)	-19.2%	
35.1 Meetings/Conferences Registration	1,994.5	2,074.5	(80.0)	-3.9%	Virtual registrations MUCH lower than budgeted; First-time member registration rate revenue trailing budget - 130+ free registrations (new member benefits)
35.2 Certification Registration	270.0	270.0	-	0.0%	
35.3 Education Registration	2,270.0	2,120.0	150.0	7.1%	In-Company/Chapter trainings are 2X last year and significantly greater than budget offset slightly by forecasted sales lagging a bit at the Dubai GTC
37 Special Project Income			-	0.0%	
38 Contribution Income	41.8	41.8	-	0.0%	
41.1 AHR Exposition Income	6,260.0	6,400.0	(140.0)	-2.2%	Actual estimates - 488,000 NSF vs. 500,000 NSF used for budget
41.2 Contributions and Matching Gifts	(1,437.4)	(1,437.4)	-	0.0%	
41.3 Exposition Income - Other Countries	102.2	58.0	44.2	76.2%	Budget was based on 44,000 NSF; Actual results were 58,000 NSF
44 Reserve Transfers			-	0.0%	
46 Miscellaneous Income	517.2	457.2	60.0	13.1%	Interest Income was not budgeted for FY22-23 as short term interest rates didn't go above 1% until late May 2022; YTD - \$38K
TOTAL REVENUES	25,233.3	25,461.3			
EXPENSES:					
51 Salaries	9,255.3	9,255.3	-	0.0%	
52 Payroll Taxes, Benefits, Personnel	2,611.6	2,612.6	(1.0)	0.0%	
61 Publishing	1,304.4	1,270.3	34.1	2.7%	Increase in forecasted sales of publications (higher publication costs)
62 Promotion (All Depts)	1,262.8	1,348.1	(85.3)	-6.3%	Decrease in forecasted advertising income (lower sales commission expense)
64 Meetings/Conferences	2,237.7	2,237.7	-	0.0%	
64 Education Courses/Trainings	641.5	654.5	(13.0)	-2.0%	Fewer courses at Dubai GTC than budgeted in FY22-23
66 Travel	2,146.6	2,151.6	(5.0)	-0.2%	
68 Awards, Certif, Logo Cost of Goods Sold	164.0	164.0	-	0.0%	
71 Research Projects & Grants	182.7	182.7	-	0.0%	
73 Special Projects			-	0.0%	
76 Public Relations	74.9	74.9	-	0.0%	
78 Occupancy & Insurance	842.5	842.5	-	0.0%	
82 Office Expense and Organizational Dues	1,491.5	1,515.1	(23.6)	-1.6%	
84 Outside Services	2,333.5	2,341.5	(8.0)	-0.3%	
88 Other Expenses	752.5	762.6	(10.1)	-1.3%	
90 Depreciation	882.1	906.9			
91 Allocation of Overhead & BOD	(829.9)	(829.9)			
TOTAL EXPENSES	25,353.7	25,490.4			
SURPLUS (DEFICIT)	(120.4)	(29.1)			

ASHRAE
ASHRAE CONSOLIDATED (excl Foundation)
For the Six Months Ending Saturday, December 31, 2022

Fiscal YTD Through Month of Dec				TWELVE MONTHS ENDING JUNE 30					J	K		
Actual	Budget	Actual	Budget	Actual	Actual	Actual	Forecast	Budget	DRAFT	DRAFT		
FY 2022	FY 2022	FY 2023	FY 2023	FY 2020	FY 2021	FY 2022	FY 2023	FY 2023	FY 2024	FY 2025		
				REVENUES								
\$3,900.5	\$3,850.5	\$3,974.9	\$3,990.6	31 Membership Dues	\$7,884.8	\$7,870.7	\$7,865.7	\$8,019.0	\$8,019.0	\$8,080.8	\$8,255.1	
1,546.0	1,726.5	1,610.6	1,527.3	32 Publication Sales	3,722.2	3,521.4	3,383.5	3,914.7	3,819.7	3,875.7	3,956.0	
1,103.7	1,121.7	1,073.8	1,224.4	34 Advertising Income - Print	2,584.3	1,723.3	2,313.4	2,411.8	2,524.0	2,630.0	2,682.6	
612.3	509.8	413.2	597.4	34 Advertising Income - Non-Print	657.6	1,047.5	1,178.8	1,030.0	1,275.0	1,330.0	1,356.6	
123.8	42.7	330.6	224.0	35.1 Meetings/Conferences Registration	1,693.9	532.5	1,453.9	1,994.5	2,074.5	1,991.1	2,030.6	
117.2	163.0	117.4	127.2	35.2 Certification Registration	219.7	248.7	227.2	270.0	270.0	280.0	285.6	
686.9	1,268.5	886.1	672.7	35.3 Education Registration	1,498.2	1,218.3	1,777.2	2,270.0	2,120.0	2,195.0	2,238.9	
				37 Special Project Income	51.6		73.9					
507.9	606.2	652.3	523.0	38 Contribution Income	1,784.2	1,962.3	2,092.6	1,841.8	1,841.8	1,951.8	1,990.8	
				41.1 AHR Exposition Income	6,012.6		5,397.6	6,260.0	6,400.0	6,300.0	6,300.0	
47.2	10.0	140.9	130.3	41.2 Contributions and Matching Gifts	165.0	125.0	165.5	162.6	162.6	138.1	140.8	
34.3	85.0	102.2	58.0	41.3 Exposition Income - Other Countries			34.3	102.2	58.0	200.0	204.0	
	262.5			44 Reserve Transfers		1,000.0		272.0	272.0	240.0	244.8	
145.8	199.9	176.2	136.2	46 Miscellaneous Income	622.9	494.3	566.7	517.2	457.2	387.9	394.0	
8,825.6	9,846.3	9,478.2	9,211.1	TOTAL REVENUES	26,897.0	19,744.0	26,530.3	29,065.8	29,293.8	29,600.4	30,079.8	
				EXPENSES:								
4,514.3	4,579.8	4,952.0	4,917.7	51 Salaries	9,495.0	9,016.4	9,118.6	9,835.5	9,835.5	10,193.8	10,553.7	
1,304.4	1,364.3	1,425.2	1,404.9	52 Payroll Taxes, Benefits, Personnel	2,843.4	2,084.0	2,628.4	2,773.3	2,774.3	2,948.8	3,108.8	
436.4	560.7	560.0	567.2	61 Publishing	1,604.3	1,123.4	1,507.5	1,328.4	1,294.3	1,267.6	1,292.9	
474.7	674.4	471.9	460.6	62 Promotion (All Depts)	1,105.7	890.8	1,102.1	1,272.9	1,358.2	1,425.5	1,454.0	
322.3	434.7	370.7	323.2	64 Meetings/Conferences	1,274.2	119.3	2,265.9	2,258.0	2,258.0	1,955.6	1,994.7	
176.7	345.5	243.4	273.6	64 Education Courses/Trainings	475.0	233.4	529.3	641.5	654.5	679.5	693.1	
229.0	770.4	951.3	1,015.7	66 Travel	1,328.2	38.0	951.0	2,292.3	2,297.3	2,145.8	2,188.7	
80.4	86.4	108.7	110.2	68 Awards, Certif, Logo Cost of Goods Sold	150.0	135.9	234.5	203.4	203.4	203.4	207.4	
306.1	938.2	612.4	654.3	71 Research Projects & Grants	2,332.2	1,326.6	1,744.0	2,058.1	2,058.1	2,293.4	2,339.3	
18.0				73 Special Projects	217.0	61.5	21.2					
4.4	46.8	22.5	27.6	76 Public Relations	54.2	20.9	41.5	75.2	75.2	75.2	76.7	
355.5	388.0	389.4	352.8	78 Occupancy & Insurance	799.0	680.7	699.3	842.5	842.5	744.0	759.0	
562.7	924.1	538.6	611.0	82 Office Expense and Organizational Dues	1,484.7	1,190.7	1,165.7	1,559.5	1,583.1	1,637.2	1,670.0	
815.0	910.3	781.2	866.0	84 Outside Services	2,013.9	1,928.1	1,987.2	2,333.5	2,341.5	2,094.4	2,136.3	
420.4	384.1	284.1	299.3	88 Other Expenses	521.9	499.5	959.7	830.0	840.1	761.6	776.8	
				88.1 Prepaid Expenses (contra acct)	(81.4)	99.0						
450.2	460.5	460.8	440.5	90 Depreciation	324.4	666.7	912.9	882.1	906.9	896.6	903.9	
	223.7		(0.5)	91 Allocation of Overhead & BOD								
10,470.5	13,091.9	12,172.2	12,324.1	TOTAL EXPENSES	25,941.7	20,114.9	25,868.8	29,186.2	29,322.9	29,322.4	30,155.3	
(1,644.9)	(3,245.6)	(2,694.0)	(3,113.0)	SURPLUS (DEFICIT) before reserve income	955.3	(370.9)	661.5	(120.4)	(29.1)	278.0	(75.5)	
		27.5		Building Decarbonization				972.5	972.5	600.0	262.5	
		(27.5)		Reserve Funding - Bldg. Decarbonization				(972.5)	(972.5)	(600.0)	(262.5)	
0.4	61.1		300.0	91.5 Contributions - HQ Building	9,757.8	99.8	47.9	600.0	600.0	500.0	510.0	
20.7	45.0			91.6 Interest Expense - HQ		28.9	26.0					
2,009.3				91.8 PPP Loan Forgiveness		2,215.2	2,009.3					
				Reserve Investment Income:								
814.5	(80.5)	188.9	479.6	95 Investmt Income - Reserves (net of exp)	(373.7)	4,709.0	(2,347.0)	959.2	959.2	760.0	775.2	
	(262.5)			96 Transfer Reserves Portion Used Currently		(1,000.0)		(272.0)	(272.0)	(240.0)	(244.8)	
814.5	(343.0)	188.9	479.6	Remaining Reserve Investment Income	(373.7)	3,709.0	(2,347.0)	687.2	687.2	520.0	530.4	
1,158.6	(3,572.5)	(2,505.1)	(2,333.4)	OVERALL SURPLUS (DEFICIT) after reserve income	10,339.4	5,624.2	345.7	1,166.8	1,258.1	1,298.0	964.9	

ASHRAE
GENERAL (Fund 2)
For the Six Months Ending Saturday, December 31, 2022

Fiscal YTD Through Month of Dec				TWELVE MONTHS ENDING JUNE 30					J	K	
Actual	Budget	Actual	Budget	Actual	Actual	Actual	Forecast	Budget	DRAFT	DRAFT	
FY 2022	FY 2022	FY 2023	FY 2023	FY 2020	FY 2021	FY 2022	FY 2023	FY 2023	FY 2024	FY 2025	
REVENUES											
\$3,822.5	\$3,774.0	\$3,895.4	\$3,910.8	31 Membership Dues	\$7,727.4	\$7,713.0	\$7,708.1	\$7,858.5	\$7,858.5	\$7,913.6	\$8,084.6
1,546.0	1,726.5	1,610.6	1,527.3	32 Publication Sales	3,722.2	3,521.4	3,383.5	3,914.7	3,819.7	3,875.7	3,956.0
1,103.7	1,121.7	1,073.8	1,224.4	34 Advertising Income - Print	2,584.3	1,723.3	2,313.4	2,411.8	2,524.0	2,630.0	2,682.6
612.3	509.8	413.2	597.4	34 Advertising Income - Non-Print	657.6	1,047.5	1,178.8	1,030.0	1,275.0	1,330.0	1,356.6
123.8	42.7	330.6	224.0	35.1 Meetings/Conferences Registration	1,693.9	532.5	1,453.9	1,994.5	2,074.5	1,991.1	2,030.6
117.2	163.0	117.4	127.2	35.2 Certification Registration	219.7	248.7	227.2	270.0	270.0	280.0	285.6
686.9	1,268.5	886.1	672.7	35.3 Education Registration	1,498.2	1,218.3	1,777.2	2,270.0	2,120.0	2,195.0	2,238.9
				37 Special Project Income	51.6		73.9				
49.6	19.7	31.1	17.9	38 Contribution Income	29.0	228.7	83.9	41.8	41.8	41.8	42.6
				41.1 AHR Exposition Income	6,012.6		5,397.6	6,260.0	6,400.0	6,300.0	6,300.0
47.2	10.0	140.9	130.3	41.2 Contributions and Matching Gifts	(1,735.0)	125.0	(1,334.5)	(1,437.4)	(1,437.4)	(1,561.9)	(1,593.2)
34.3	85.0	102.2	58.0	41.3 Exposition Income - Other Countries			34.3	102.2	58.0	200.0	204.0
	127.5			44 Reserve Transfers							
145.8	199.9	176.2	136.2	46 Miscellaneous Income	622.9	494.3	566.7	517.2	457.2	387.9	394.0
8,289.3	9,048.3	8,777.5	8,626.2	TOTAL REVENUES	23,084.4	16,852.7	22,864.0	25,233.3	25,461.3	25,583.2	25,982.3
EXPENSES:											
4,231.9	4,354.1	4,659.5	4,627.7	51 Salaries	8,987.7	8,446.2	8,549.0	9,255.3	9,255.3	9,623.1	9,962.8
1,224.0	1,302.0	1,345.5	1,324.0	52 Payroll Taxes, Benefits, Personnel	2,698.5	1,934.1	2,500.1	2,611.6	2,612.6	2,786.4	2,943.2
433.5	545.9	551.9	553.1	61 Publishing	1,598.8	1,119.3	1,503.2	1,304.4	1,270.3	1,243.6	1,268.5
470.4	667.1	471.9	456.5	62 Promotion (All Depts)	1,102.1	887.8	1,097.8	1,262.8	1,348.1	1,415.4	1,443.7
322.3	423.7	359.5	311.3	64 Meetings/Conferences	1,249.8	119.3	2,260.6	2,237.7	2,237.7	1,935.2	1,973.9
176.7	345.5	243.4	273.6	64 Education Courses/Trainings	475.0	233.4	529.3	641.5	654.5	679.5	693.1
223.3	699.8	892.0	921.5	66 Travel	1,252.9	38.0	915.5	2,146.6	2,151.6	2,000.2	2,040.2
35.8	48.7	59.8	71.8	68 Awards, Certif, Logo Cost of Goods Sold	80.3	90.9	177.1	164.0	164.0	164.0	167.3
157.2	168.7	161.1	174.1	71 Research Projects & Grants	166.1	157.2	160.5	182.7	182.7	182.7	186.3
18.0				73 Special Projects	217.0	61.5	21.2				
4.4	46.7	22.5	27.5	76 Public Relations	54.2	20.9	41.5	74.9	74.9	74.9	76.4
355.5	388.0	389.4	352.8	78 Occupancy & Insurance	799.0	680.7	699.3	842.5	842.5	744.0	759.0
550.6	892.1	532.7	576.8	82 Office Expense and Organizational Dues	1,451.8	1,172.2	1,145.7	1,491.5	1,515.1	1,569.2	1,600.6
815.0	910.3	781.2	866.0	84 Outside Services	2,013.9	1,928.1	1,987.2	2,333.5	2,341.5	2,094.4	2,136.3
408.3	352.2	267.9	273.4	88 Other Expenses	473.9	460.8	909.0	752.5	762.6	684.1	697.8
				88.1 Prepaid Expenses (contra acct)	(81.4)	99.0					
450.2	460.5	460.8	440.5	90 Depreciation	324.4	666.7	912.9	882.1	906.9	896.6	903.9
(359.1)	(167.6)	(370.1)	(415.5)	91 Allocation of Overhead & BOD	(672.8)	(647.2)	(740.9)	(829.9)	(829.9)	(787.6)	(816.9)
9,518.0	11,437.7	10,829.0	10,835.1	TOTAL EXPENSES	22,191.2	17,468.9	22,669.0	25,353.7	25,490.4	25,305.7	26,036.1
(1,228.7)	(2,389.4)	(2,051.5)	(2,208.9)	SURPLUS (DEFICIT) before reserve income	893.2	(616.2)	195.0	(120.4)	(29.1)	277.5	(53.8)
		27.5		Building Decarbonization				972.5	972.5	600.0	262.5
		(27.5)		Reserve Funding - Bldg. Decarbonization				(972.5)	(972.5)	(600.0)	(262.5)
0.4	61.1		300.0	91.5 Contributions - HQ Building	9,757.8	99.8	47.9	600.0	600.0	500.0	510.0
20.7	45.0			91.6 Interest Expense - HQ		28.9	26.0				
2,009.3				91.8 PPP Loan Forgiveness		2,215.2	2,009.3				
				Reserve Investment Income:							
545.0	32.0	135.1	349.7	95 Investmt Income - Reserves (net of exp)	(230.2)	3,182.4	(1,571.2)	699.4	699.4	500.0	510.0
	(127.5)			96 Transfer Reserves Portion Used Currently							
545.0	(95.5)	135.1	349.7	Remaining Reserve Investment Income	(230.2)	3,182.4	(1,571.2)	699.4	699.4	500.0	510.0
1,305.3	(2,468.8)	(1,916.4)	(1,559.2)	OVERALL SURPLUS (DEFICIT) after reserve income	10,420.8	4,852.3	655.0	1,179.0	1,270.3	1,277.5	966.2

ASHRAE
BOARD OF DIRECTORS 2-5nn
For the Six Months Ending Saturday, December 31, 2022

Fiscal YTD Through Month of Dec				TWELVE MONTHS ENDING JUNE 30					J	K		
Actual	Budget	Actual	Budget	Actual	Actual	Actual	Forecast	Budget	DRAFT	DRAFT		
FY 2022	FY 2022	FY 2023	FY 2023	FY 2020	FY 2021	FY 2022	FY 2023	FY 2023	FY 2024	FY 2025		
				REVENUES								
\$32.1	\$4.6	\$8.8	\$4.6		\$175.3	\$41.8	\$9.3	\$9.3	\$9.3	\$9.5		
	38.4											
0.5	2.7	0.1	3.9	1.1	0.4	0.8	10.0	10.0	10.0	10.2		
32.6	45.7	8.9	8.5	1.1	175.7	42.6	19.3	19.3	19.3	19.7		
				EXPENSES:								
507.7	585.1	561.9	556.5	1,143.0	1,160.0	1,045.7	1,113.0	1,113.0	1,232.1	1,275.6		
143.3	160.4	152.0	155.2	356.1	234.5	332.1	310.3	310.3	350.5	357.5		
0.9	10.4	1.4	15.4	2.5	2.4	2.5	22.1	22.1	22.1	22.5		
2.0	8.2	1.1		13.3	70.7	13.5	69.9	69.9	69.9	71.3		
85.6	43.5	8.2	25.3	57.4	0.1	155.4	74.3	74.3	78.3	79.9		
134.6	238.8	439.7	376.7	559.8	32.6	438.2	938.3	938.3	784.8	800.5		
1.4	0.9	10.8	1.6	19.9	4.7	12.3	4.4	4.4	4.4	4.5		
	4.7		4.7				9.4	9.4	9.4	9.6		
5.2	15.3	7.2	17.3	3.3	3.4	15.0	48.1	48.1	48.1	49.1		
33.1	91.2	50.1	60.4	78.0	56.1	101.5	234.1	234.1	226.6	231.1		
3.8	7.2		7.2	6.9		12.9	16.1	16.1	16.1	16.4		
20.0	20.0	20.0	12.5	40.0	40.0	40.0	25.0	25.0	25.0	25.5		
(937.7)	(1,442.4)	(1,252.4)	(1,432.5)	(2,280.3)	(1,621.7)	(2,116.5)	(2,865.1)	(2,865.1)	(2,867.4)	(2,943.6)		
	(256.7)		(199.7)	(17.2)	52.6	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)		
32.6	302.4	8.9	208.2	1.1	192.9	(10.0)	19.4	19.4	19.4	19.8		
				TOTAL EXPENSES								
				SURPLUS (DEFICIT) before reserve income								

**ASHRAE
OVERHEAD 2-9nn
For the Six Months Ending Saturday, December 31, 2022**

Fiscal YTD Through Month of Dec				TWELVE MONTHS ENDING JUNE 30					DRAFT	DRAFT
Actual	Budget	Actual	Budget	Actual	Actual	Actual	Forecast	Budget	Budget	Budget
FY 2022	FY 2022	FY 2023	FY 2023	FY 2020	FY 2021	FY 2022	FY 2023	FY 2023	FY 2024	FY 2025
REVENUES										
				\$6,012.6		\$5,397.6	\$6,260.0	\$6,400.0	\$6,300.0	\$6,300.0
				(1,900.0)		(1,500.0)	(1,600.0)	(1,600.0)	(1,700.0)	(1,734.0)
34.3	85.0	102.2	58.0			34.3	102.2	58.0	200.0	204.0
	89.1									
79.9	61.0	89.2	55.7	9.5	95.0	196.1	177.4	117.4	117.4	119.7
114.2	235.1	191.4	113.7	4,122.1	95.0	4,128.0	4,939.6	4,975.4	4,917.4	4,889.7
EXPENSES:										
1,081.6	1,201.1	1,117.9	1,160.2	2,458.6	2,118.1	2,147.9	2,320.4	2,320.4	2,388.4	2,472.7
323.8	404.9	356.0	342.1	757.1	464.2	600.0	655.9	655.9	705.3	820.4
1.9	3.6	20.0	3.4	4.8	19.5	8.4	7.1	7.1	7.4	7.5
4.5	27.0	7.6	10.8	66.8	9.3	32.9	95.2	95.2	95.2	97.1
1.1	10.8	3.9	4.7	3.0	0.3	4.6	13.2	13.2	13.5	13.8
12.1	77.4	24.5	53.3	92.5	4.8	59.4	101.4	101.4	101.9	103.9
2.1	21.7	7.8	17.5	18.5	8.6	23.5	30.4	30.4	30.4	31.1
4.4	46.7	22.5	27.5	54.2	20.9	41.5	74.9	74.9	74.9	76.4
334.6	365.7	381.1	335.4	748.0	626.9	668.4	803.5	803.5	703.0	717.1
165.1	318.6	141.9	175.6	347.2	271.8	270.1	407.2	407.2	451.2	460.2
396.3	372.1	330.9	399.0	703.7	687.8	816.4	798.4	818.4	731.8	746.4
30.5	95.2	32.7	39.4	75.8	78.1	127.8	107.6	117.5	107.6	109.7
412.1	423.0	422.7	410.5	248.2	590.5	836.7	822.1	846.9	792.6	808.4
(2,769.8)	(3,294.6)	(2,882.9)	(3,146.1)	(5,575.8)	(4,937.6)	(5,599.2)	(6,292.3)	(6,292.3)	(6,203.2)	(6,464.7)
0.3	73.2	(13.4)	(166.7)	2.6	(36.8)	38.4	(55.0)	(0.3)	0.0	0.0
113.9	161.9	204.8	280.4	4,119.5	131.8	4,089.6	4,994.6	4,975.7	4,917.4	4,889.7
SURPLUS (DEFICIT) before reserve income										

ASHRAE
MEMBERS COUNCIL (2-2nn & 2-8nn)
For the Six Months Ending Saturday, December 31, 2022

Fiscal YTD Through Month of Dec			
Actual	Budget	Actual	Budget
FY 2022	FY 2022	FY 2023	FY 2023
\$3,822.5	\$3,774.0	\$3,895.4	\$3,910.8
123.8	42.7	330.6	224.0
0.3			
5.4	7.1	14.1	8.6
39.0	10.0	8.5	10.0
37.8	65.3	30.4	37.8
4,028.8	3,899.1	4,279.0	4,191.2
802.3	711.3	945.8	883.5
225.6	196.4	257.7	246.3
6.1	18.9	9.4	19.1
80.5	185.8	130.4	112.1
235.0	353.7	343.0	276.5
63.5	250.6	372.4	389.4
31.9	25.3	41.1	52.6
157.2	164.0	161.1	169.4
154.7	205.3	124.9	165.2
75.9	54.9	65.3	78.3
153.8	164.7	183.8	166.5
1,015.2	1,213.3	1,196.8	1,265.3
3,001.7	3,544.2	3,831.7	3,824.2
1,027.1	354.9	447.3	367.0

TWELVE MONTHS ENDING JUNE 30					DRAFT	DRAFT
Actual	Actual	Actual	Forecast	Budget	Budget	Budget
FY 2020	FY 2021	FY 2022	FY 2023	FY 2023	FY 2024	FY 2025
REVENUES						
\$7,727.4	\$7,713.0	\$7,708.1	\$7,858.5	\$7,858.5	\$7,913.6	\$8,084.6
1,693.9	532.5	1,453.9	1,994.5	2,074.5	1,991.1	2,030.6
	25.4	0.3				
18.9	26.6	14.4	21.0	21.0	21.0	21.4
30.0	25.0	49.0	22.1	22.1	22.1	22.5
114.2	133.5	205.2	172.0	172.0	96.7	98.6
9,584.4	8,456.0	9,430.9	10,068.1	10,148.1	10,044.5	10,257.7
EXPENSES:						
1,479.2	1,502.8	1,667.2	1,767.0	1,767.0	1,876.5	1,942.7
445.0	334.0	479.8	492.6	492.6	533.8	544.4
14.6	17.1	19.0	31.6	31.6	31.6	32.2
202.5	146.3	266.4	255.8	255.8	290.9	296.7
1,168.7	118.8	2,082.6	2,120.0	2,120.0	1,813.3	1,849.5
445.4	0.1	339.8	814.1	814.1	811.7	827.9
41.5	77.3	140.6	126.0	126.0	126.0	128.5
166.1	157.2	160.5	173.3	173.3	173.3	176.7
327.3	300.8	290.3	397.6	397.6	398.2	406.1
164.2	339.4	285.6	227.5	227.5	160.6	163.8
268.3	259.0	431.1	378.1	378.1	337.7	344.4
(5.9)	19.4					
1,963.7	1,703.7	2,168.7	2,530.9	2,530.9	2,589.3	2,685.8
6,680.6	4,975.9	8,331.6	9,314.5	9,314.5	9,142.9	9,398.7
2,903.8	3,480.1	1,099.3	753.6	833.6	901.6	859.0
SURPLUS (DEFICIT) before reserve income						

ASHRAE
PUBLISHING & EDUCATION COUNCIL (2-4nn & 5-5nn)
For the Six Months Ending Saturday, December 31, 2022

Fiscal YTD Through Month of Dec				TWELVE MONTHS ENDING JUNE 30					J	K		
Actual	Budget	Actual	Budget	Actual	Actual	Actual	Forecast	Budget	DRAFT	DRAFT		
FY 2022	FY 2022	FY 2023	FY 2023	FY 2020	FY 2021	FY 2022	FY 2023	FY 2023	FY 2024	FY 2025		
				REVENUES								
\$1,546.0	\$1,726.5	\$1,610.6	\$1,527.3	32 Publication Sales	\$3,722.2	\$3,521.4	\$3,383.5	\$3,914.7	\$3,819.7	\$3,875.7	\$3,956.0	
1,103.7	1,121.7	1,073.8	1,224.4	34 Advertising Income - Print	2,584.3	1,723.3	2,313.4	2,411.8	2,524.0	2,630.0	2,682.6	
612.3	509.8	413.2	597.4	34 Advertising Income - Non-Print	657.6	1,047.5	1,178.8	1,030.0	1,275.0	1,330.0	1,356.6	
117.2	163.0	117.4	127.2	35.2 Certification Registration	219.7	248.7	227.2	270.0	270.0	280.0	285.6	
686.6	1,268.5	886.1	672.7	35.3 Education Registration	1,498.2	1,193.0	1,776.8	2,270.0	2,120.0	2,195.0	2,238.9	
12.2	7.9	8.2	4.7	38 Contribution Income	10.1	26.8	27.8	11.5	11.5	11.5	11.7	
8.2		132.4	120.3	41.2 Contributions and Matching Gifts	135.0	100.0	116.5	140.5	140.5	116.0	118.3	
26.0	55.7	35.4	19.5	46 Miscellaneous Income	440.3	224.2	162.9	127.3	127.3	133.3	134.4	
4,112.2	4,853.1	4,277.1	4,293.5	TOTAL REVENUES	9,267.4	8,084.9	9,186.9	10,175.8	10,288.0	10,571.5	10,784.1	
				EXPENSES:								
1,190.9	1,271.1	1,343.9	1,333.2	51 Salaries	2,665.2	2,453.3	2,387.5	2,666.5	2,666.5	2,827.8	2,927.7	
347.9	372.8	379.8	386.9	52 Payroll Taxes, Benefits, Personnel	785.8	588.8	690.3	765.7	766.7	827.6	844.1	
424.6	508.7	521.1	516.8	61 Publishing	1,576.7	1,080.3	1,473.3	1,241.0	1,206.9	1,179.9	1,203.5	
383.4	445.8	332.9	333.4	62 Promotion (All Depts)	819.7	661.4	785.0	841.5	926.8	959.0	978.2	
	11.4		0.6	64 Meetings/Conferences	9.0		17.4	23.1	23.1	23.1	23.5	
176.7	345.5	243.4	273.6	64 Education Courses/Trainings	475.0	233.4	529.3	641.5	654.5	679.5	693.1	
7.1	49.1	40.2	41.3	66 Travel	51.7	0.6	43.2	111.7	116.7	120.7	123.1	
0.1	0.6		0.1	68 Awards, Certif, Logo Cost of Goods Sold	0.2	0.1	0.3	1.2	1.2	1.2	1.2	
20.8	22.3	8.2	17.5	78 Occupancy & Insurance	51.0	53.8	30.9	39.0	39.0	41.0	41.9	
225.0	231.8	258.7	217.2	82 Office Expense and Organizational Dues	676.0	496.9	471.7	516.0	539.6	549.1	560.1	
298.8	389.3	298.2	320.7	84 Outside Services	1,004.3	837.3	744.4	997.1	985.1	971.1	990.6	
220.2	85.1	50.8	60.2	88 Other Expenses	122.9	123.7	337.3	250.7	250.7	222.7	227.1	
0.3		0.3		90 Depreciation	0.6	0.6	0.6					
1,509.9	2,294.7	1,695.2	1,894.3	91 Allocation of Overhead & BOD	3,558.0	2,784.3	3,115.7	3,789.4	3,789.4	3,902.1	4,047.4	
4,805.7	6,028.2	5,172.7	5,395.8	TOTAL EXPENSES	11,796.1	9,314.5	10,626.9	11,884.4	11,966.2	12,304.8	12,661.5	
(693.5)	(1,175.1)	(895.6)	(1,102.3)	SURPLUS (DEFICIT) before reserve income	(2,528.7)	(1,229.6)	(1,440.0)	(1,708.6)	(1,678.2)	(1,733.3)	(1,877.4)	

ASHRAE
RESEARCH (funds 3 & 4)
For the Six Months Ending Saturday, December 31, 2022

Fiscal YTD Through Month of Dec				TWELVE MONTHS ENDING JUNE 30					DRAFT	DRAFT		
Actual	Budget	Actual	Budget	Actual	Actual	Actual	Forecast	Budget	Budget	Budget		
FY 2022	FY 2022	FY 2023	FY 2023	FY 2020	FY 2021	FY 2022	FY 2023	FY 2023	FY 2024	FY 2025		
				REVENUES								
\$78.0	\$76.5	\$79.5	\$79.8	31 Membership Dues	\$157.4	\$157.7	\$157.6	\$160.6	\$160.6	\$167.2	\$170.5	
408.1	586.6	582.1	505.0	38 Contribution Income	1,696.0	1,685.8	1,945.9	1,800.0	1,800.0	1,910.0	1,948.2	
				41.2 Contributions and Matching Gifts	1,900.0		1,500.0	1,600.0	1,600.0	1,700.0	1,734.0	
	135.0			44 Reserve Transfers		1,000.0		272.0	272.0	240.0	244.8	
486.1	798.1	661.6	584.8	TOTAL REVENUES	3,753.4	2,843.5	3,603.5	3,832.6	3,832.6	4,017.2	4,097.5	
				EXPENSES:								
282.4	225.6	292.6	290.1	51 Salaries	507.3	570.2	569.5	580.2	580.2	570.7	590.9	
80.4	62.3	79.7	80.9	52 Payroll Taxes, Benefits, Personnel	145.0	149.9	128.3	161.8	161.8	162.3	165.6	
2.9	14.9	8.2	14.2	61 Publishing	5.5	4.1	4.4	24.0	24.0	24.0	24.5	
4.2	7.3		4.1	62 Promotion (All Depts)	3.5	3.0	4.2	10.2	10.2	10.2	10.4	
	10.9	11.2	12.0	64 Meetings/Conferences	24.0		5.2	20.3	20.3	20.3	20.8	
5.7	70.7	59.2	94.2	66 Travel	72.4		35.5	145.7	145.7	145.7	148.6	
39.6	37.7	43.9	38.4	68 Awards, Certif, Logo Cost of Goods Sold	29.8	29.9	42.5	39.4	39.4	39.4	40.2	
149.0	769.5	451.3	480.2	71 Research Projects & Grants	2,166.0	1,169.5	1,583.5	1,875.4	1,875.4	2,110.7	2,152.9	
	0.1		0.1	76 Public Relations				0.3	0.3	0.3	0.3	
11.3	32.0	5.9	34.2	82 Office Expense and Organizational Dues	27.5	17.7	19.3	68.0	68.0	68.0	69.4	
12.1	31.9	16.1	26.0	88 Other Expenses	48.0	38.6	49.4	77.5	77.5	77.5	79.0	
359.1	391.4	370.1	414.9	91 Allocation of Overhead & BOD	672.8	647.2	740.9	829.9	829.9	787.6	816.9	
946.7	1,654.3	1,338.2	1,489.3	TOTAL EXPENSES	3,701.8	2,630.1	3,182.7	3,832.7	3,832.7	4,016.7	4,119.5	
(460.6)	(856.2)	(676.6)	(904.5)	SURPLUS (DEFICIT) before reserve income	51.6	213.4	420.8	(0.1)	(0.1)	0.5	(22.0)	
				Reserve Investment Income:								
269.5	(112.5)	53.8	129.9	95 Investmt Income - Reserves (net of exp)	(147.2)	1,526.6	(775.8)	259.8	259.8	260.0	265.2	
	(135.0)			96 Transfer Reserves Portion Used Currently		(1,000.0)		(272.0)	(272.0)	(240.0)	(244.8)	
269.5	(247.5)	53.8	129.9	Remaining Reserve Investment Income	(147.2)	526.6	(775.8)	(12.2)	(12.2)	20.0	20.4	
(191.1)	(1,103.7)	(622.8)	(774.6)	OVERALL SURPLUS (DEFICIT) after reserve income	(95.6)	740.0	(355.0)	(12.3)	(12.3)	20.5	(1.6)	

REPORT TO BOARD OF DIRECTORS
From the Finance Committee
Meeting as of Friday, February 3, 2023

RECOMMENDATIONS FOR BOARD APPROVAL: None

INFORMATION ITEMS:

1. The Finance Investment Subcommittee presented their report to the Finance Committee.

The General Reserve Fund as of December 31, 2022, had total assets of \$14.4 million. The General Reserve Fund represents 57% of the forecasted General Fund total expenses for FY22-23. The ROB targets a General Reserve Fund balance that is between 1/3 and 2/3 of typical annual General Fund total expenses.

The Research Reserve Fund as of December 31, 2022, had total assets of \$6.1 million. There is no ROB target range established for the Research Reserve Fund.

The General and Research Reserve Funds have increased in value by 6.9% and 7.2%, respectively over the past 3 months and decreased in value by 8.5% and 9.1%, respectively, since March 1, 2022, or inception at Fiducient Advisors.

Finance Committee discussed and approved a motion (7,0,0 CNV) from the Finance Investment Subcommittee to add a section to the Manual of Chapter Operations ("MCO") with guidance to Chapter on investing funds that are not needed for operations along with best practices on how to manage and report on those investments. This motion will be referred to Members Council for approval to adding this section to the MCO.

Finance Committee also discussed possible further recommendations to Chapters/Regions regarding the timing of the movement of funds from a bank account to investments/interest bearing financial instruments and other possible alternatives such as the Foundation.

The Investment Subcommittee also discussed with Fiducient Advisors who recommended reallocating a portion of equity portfolio to Marketable Alternatives/Hedge Funds as part of the overall investment allocation in the Reserve Funds to achieve similar investment returns while reducing volatility. The Investment Subcommittee recommended to the Finance Committee to make this change as this complies with the current ASHRAE Investment policy. Finance Committee agreed with this recommendation.

2. The Finance Planning Subcommittee presented their report to the Finance Committee. The Planning Subcommittee primarily focused on evaluating various financial training programs used by Chapters/Regions in and outside of the U.S. and making recommendations on changes/updates and newly developed items. They will also be driving the SY 23-24 Budget process and will be working with the Councils, ExCom and the BOD to prepare and present the SY 23-24 Budget to the BOD for approval at the Annual Meeting in June.
3. Finance Committee also reviewed and discussed:
 - MBO #1 – Financial Dashboards/KPIs/Council financial performance – Ongoing
 - MBO #2 – Financial Training review and development Society-wide – Ongoing
 - MBO #3 – Review of MOP and Reference Manual – Ongoing

4. The Consolidated Audited Financial Statements for FY 2021-22 were presented to the Finance Committee for informational purposes only as they were previously approved by the Audit Committee in their November 8, 2022 meeting (will be presented to the BOD from the Audit Committee as an information item at the February 8, 2023 BOD meeting). Finance Committee members reviewed and discussed.
5. Finance Committee also reviewed and discussed the Finance Dashboards as well as the Treasurer's Presentation. There will be a workshop scheduled in the spring to further discuss KPIs and potential tweaks to the Dashboards.



February 3, 2023

Date

Dennis Knight, Chair

REPORT TO THE BOARD OF DIRECTORS
From the Executive Committee
As of October 14, 2022

Recommendations for Board Approval:

None.

Information Items:

1. The Executive Committee discussed technical guides developed by chapters; including, how they are reviewed, how they can be distinguished from ASHRAE Society documents, disclaimers and graphic templates, and how to develop a standardized process.

An action item was assigned to Mr. Conlan and staff to develop a process for reviewing Chapter created technical documents, and for how the technical side of Society can be connected to the grassroots vis-à-vis the review of technical documents developed by Chapters.

2. ExCom had a discussion of current MOU strategies. There was consensus that individual MOUs with AASA members were not needed; instead, a plaque recognizing their AASA member was recommended.

An action item was to Mr. Austin to develop a work plan for ISHRAE in the wake of the approval of the ISHRAE/ASHRAE MOU.

3. The important of encouraging SSPC 90.1 to consider incorporating building decarbonization content into the standard was discussed. It was agreed that a letter would be sent under President Mehboob's signature, emphasizing the Board's reaffirmation of ASHRAE's Vision 2030 and the importance of framing building performance based on carbon in addition to energy.

4. President Mehboob received an email regarding concerns about purchased marketing messages sent out by ASHRAE that suggested the Society favored refrigerant R-32. Staff agreed to strengthen the disclaimers on these messages so that is clear they are purchased commercials and not Society positions.

5. The program for Winter Conference VIPs from other organizations was discussed. ExCom underscored the importance of VIP partnerships and agreed that ASHRAE's current plan is working well.

January 25, 2023

Date



Chair

REPORT TO THE BOARD OF DIRECTORS
From the Executive Committee
As of November 1, 2022

Recommendations for Board Approval:

None.

Information Items:

1. The Executive Committee discussed the Istanbul meetings, CRC, and HVAC summit. The Committee discussed lessons learned, the possibility of regular summits, value in BOD members seeing CRC motions, and the like.

There was also discussion of previous and upcoming industry roundtables. The roundtables have been conducted with industry leaders and manufacturers. The goal of the roundtables was for Society to listen to the customer and, hopefully, develop products and services that are in demand.

Staff will compile the minutes from all of the industry roundtables into a single document and circulate the compiled document to ExCom and the BOD.

2. Mr. Knight was assigned to lead a group of members to study the feasibility of the BOD conducting meetings alongside CRCs in different regions. The group will provide a recommendation on a policy moving forward. The group was asked to consider the report coming forward from the ASHRAE at International Conferences Task Group. The recommendation will also include financial details for visiting CRCs in different regions.

3. ExCom discussed payments to members and Mr. Macauley presented recommendations regarding courses and policies regarding BOD members being paid as ALI instructors while serving on the BOD.

It was recommended that further investigation be done to make ALI courses more local. It was suggested that translating courses into other languages could help facilitate courses being more localized.

It was also suggested that Society do a better job to advertise the call for ALI instructors.

4. ExCom discussed the importance of collaborating with the Institute for Market Transformation (IMT), particularly on Building Performance Standards. It was agreed that further outreach to IMT is needed.

January 25, 2023

Date



Chair

REPORT TO THE BOARD OF DIRECTORS
From the Executive Committee
As of February 4, 2023

Recommendations for Board Approval:

MOTION 1: ExCom recommends that the Board of Directors waive Rule of the Board 1.201.004.9 (B), (C) and (D), Indoor Air Quality or Ventilation Standards and Rule of the Board 2.425.003.1 (C), Operation/General Requirements for the development of previously approved Standard 241P, *Standard to Address Mitigation of Airborne Infection Transmission*.

BACKGROUND: During the December 6, 2022, web meeting the Board approved the following motion: “ASHRAE develop a non-ANSI standard to mitigate the risk of respiratory pathogens in buildings as defined in Attachment B.” After the call for members was announced along with the press release, concerns were received from members in good standing that this action may have conflicted with several Rules of the Board. These rules address the policies of how ASHRAE standards are to be developed and restrict technical content of the standards. In particular standards may:

- A. Only limit pollutants that “normally considered in the design” of HVAC systems.
- B. Only address Contaminants or other airborne concentrations that can be measured with test equipment that is available to test and balance technicians or common to building ventilation assessment.
- C. Shall not make claims/guarantees that compliance will provide health, comfort or occupant acceptability but strive to achieve those objectives.
- D. Only specify contaminants or other airborne concentrations that an internationally recognized authority has established permissible limits and there are established test procedures.

EHC has agreed to recommend revisions to the Rule of the Board 1.201.004.9 by the 2023 Annual Conference that are more in tune with current times. Technology Council will work on revisions to Rule of the Board 2.425.003.1 to allow the development of non-ANSI standards.

FISCAL IMPACT: None.

MOTION 2: The Executive Committee recommends that the Board of Directors approve the Memorandum of Understanding (MOU), shown in ATTACHMENT A, between ASHRAE and the Pan American Health Organization (PAHO), a division of the World Health Organization (WHO).

BACKGROUND: Both ASHRAE and PAHO/WHO recognize the benefits of technical collaboration that will contribute to the shared goals of serving humanity by advancing healthy, sustainable, efficient, and resilient buildings including, in particular, buildings in the public sector of developing countries.

To provide a strong foundation for this new relationship, we are recommending the approval of the attached MOU, which is based upon a WHO template. A WHO template was chosen by the Work Group to ease its approval through the WHO legal department, where the document is currently pending.

Additional initiatives are envisioned between ASHRAE and PAHO/WHO, as described below. These future initiatives can be incorporated into the MOU as an annex, on a case-by-case basis.

FISCAL IMPACT: None envisioned at this point in time. Additional initiatives are envisioned between ASHRAE and PAHO/WHO, some of which may contain a fiscal impact. Those initiatives will be developed, and the fiscal impact identified, on a case-by-case basis.

Information Items:

1. Mr. Conlan presented a draft Region/Chapter Publications Policy to ExCom (ATTACHMENT B). The intent of the effort was to evaluate and determine an approach to allow for Chapters or Regions to submit a document that they created. The goal was to determine what type and amount of ASHRAE logos or names should be on said document as well as to determine the level of disclaimers on the document. The request was for this process to be quick so that Chapters and Regions who create materials do not have to wait the normal length of time for documents to be formally published.

A flow chart and form template were created and are included in ATTACHMENT B. The flow chart shows the step-by-step process and proposed timeline to receive the submission and evaluation completed.

2. The Executive Committee approved a new Public Policy Issue Brief (PPIB) on building electrification. The approved PPIB is included in ATTACHMENT C. PPIBs are frequently used as briefing documents and are an integral tool for the Society’s Government Affairs activities.

3. Work plans are being developed for both ISHRAE and CAMEE (Coalition of American Mechanical and Electrical Engineers) MOUs,

4. In the wake of the successful Istanbul summit, ExCom discussed the possibility of running another international summit event in SY 2023-24. The cadence of having summits every 1, 2, or 3 years was discussed along with the need to act on summit findings.

February 5, 2023
Date

Chair

MEMORANDUM OF UNDERSTANDING

between

**the World Health Organization,
20 avenue Appia, 1211 Geneva, Switzerland
("WHO")**

and

**ASHRAE
180 Technology Parkway
Peachtree Corners, Georgia 30092**

WHEREAS the World Health Organization (Hereinafter referred to as "WHO"), having its headquarters in Geneva, Switzerland, is an international intergovernmental organization and specialized agency of the United Nations and the directing and coordinating authority on international health, and provides leadership on global health matters, shapes the research agenda, sets health norms and standards, articulates evidence-based policy options, provides technical support to countries, and monitors and assesses health trends.

WHEREAS the aims of ASHRAE, a not-for-profit corporation, are to serve humanity by advancing the arts and sciences of heating, ventilation, air conditioning, refrigeration and their allied fields

WHEREAS WHO and ASHRAE, hereinafter also referred to as "the Parties", believe that technical collaboration between the two organizations will contribute to the shared goals of serving humanity by advancing healthy, sustainable, efficient and resilient buildings including in particular, buildings in the public sector of developing countries;

WHEREAS the Parties furthermore believe that agreement in advance on certain aspects of individual collaborative projects (as the Parties may identify on a case-by-case basis) will facilitate the early implementation of such projects, in particular by facilitating the conclusion of the agreements to which such projects would be subject;

NOW, therefore, the Parties hereby agree as follows:

1. Areas of collaboration

The parties agree to investigate and identify potential collaborative projects of mutual interest which are consistent with the goals of each organization. Collaborations in publications will be done under the terms of specific agreements for each publication on a case-by-case basis.

2. Collaborative activities

Any collaborative activity as outlined in article 1 above shall be subject to the availability of sufficient financial and human resources for that purpose, as well as each Party's programme of work, priority activities, internal rules, regulations, policies, administrative procedures, and practices. Each collaborative activity shall thus be agreed on a case-by case-basis, subject to a separate exchange of letters or agreement, including the development of a work plan.

3. Funding

- 3.1 Each Party hereto shall be fully responsible for the funding of its activities under this Memorandum of Understanding (MoU), except as may otherwise expressly be agreed in any subsequent letter of agreement.
- 3.2 Each Party shall administer the funds handled by it in accordance with its financial regulations, rules, and administrative practices.

4. Confidentiality

It is acknowledged that each Party may possess confidential information, which is proprietary to it or to third parties collaborating with it. Any such information shall only be shared between the Parties under a separate confidential disclosure agreement, specifically covering such information.

5. Publications

- 5.1 Subject to each Party's proprietary rights and/or the proprietary rights of others, and without prejudice to obligations of confidentiality, the results of any collaborative activity under this MoU may be published by either Party. The Parties are encouraged to publish the results of their joint work in a collaborative fashion. Guidelines for authorship of major, international, peer-reviewed journals will be used to establish authorship of collaborative publications. In regard to separate publications, it is agreed that in order to avoid prejudicing proprietary rights and the confidentiality of information, the publishing Party shall transmit to the other party for its review the material intended to be published at least 60 days before a proposed publication is submitted to any editor, publisher, referee, or meeting organizer. In the absence of any objection by the other Party within that 60 day period, concerning prejudice to proprietary rights or confidentiality of information, the publication may proceed.
- 5.2 Copyright in any publications resulting from or relating to any of the collaborative activities under this MoU and prepared by one of the Parties hereto on its own, shall

be vested in that Party, provided however, that any such publication shall be submitted to the other Party for review and comment in accordance with paragraph 5.1 above.

5.3 In the event that any publications are jointly prepared by WHO and ASHRAE, the Parties shall consult in good faith and designate one of the Parties to act as the lead publishing Party in each case. – If the Parties designate WHO to act as the lead publishing Party, ASHRAE will retain copyright in its contribution to the publication and will grant WHO a non-exclusive, sub-licensable, world-wide, royalty-free license to deal with the contribution for all purposes, in all manners and in all formats, as part of the publication. In such case, copyright in the final published work will vest in WHO.

- If the Parties designate ASHRAE to act as the lead publishing Party, WHO will retain copyright in its contribution to the publication and will grant ASHRAE a non-exclusive, sub-licensable, world-wide, royalty-free license to deal with the contribution for all purposes, in all manners and in all formats, as part of the publication. In such case, copyright in the final published work will vest in ASHRAE.5.4 Both Parties shall be duly acknowledged in any publication resulting from the collaborative activities and the wording of such acknowledgement shall be agreed between the Parties. In addition to review of the content of publications as referred to in paragraph 5.1 above, each Party shall have the right to review the acknowledgement and request reasonable changes to the use of its name, or request that its name be deleted altogether.5.5 No publication or other work resulting from the collaborative activities under this MoU shall contain commercial advertising or be used for the promotion of any commercial product or service.

6. Products resulting from the collaboration

- 6.1 The Parties shall make appropriate arrangements to promote that any product which may result from collaborative research and development work undertaken as a result of this MoU, shall be made widely available to the public on reasonable terms, including in particular to the public sector of developing countries on preferential terms. Any possible additional benefits, including royalties, shall be granted to each Party with due account being taken of the relative value of each Party's financial, intellectual, and other contributions to the product (provided that priority shall always be given to the objective of the Parties set forth in the first sentence of this paragraph 6.1).
- 6.2 Ownership of any intellectual property rights arising from collaborative activities under this MoU shall be agreed by the Parties on a case-by-case basis. However, regardless of whether the Parties shall agree that ownership of the intellectual property rights of a particular collaborative activity shall be vested in WHO or in ASHRAE alone, or in any third party, the Parties agree that the industrial or commercial exploitation of such rights shall be designed to achieve the objectives set forth in paragraph 6.1 above and shall be subject to and exercised in accordance

with an agreement to be negotiated in good faith between WHO or ASHRAE and the third party concerned, as the case may be.

7. Liability

7.1 Each Party shall be solely responsible for the manner in which it carries out its part of the collaborative activities under this MoU. Thus, a Party shall not be responsible for any loss, accident, damage, or injury suffered or caused by the other Party, or that other Party's staff or sub-contractors, in connection with, or as a result of, the collaboration under this MoU.

7.2 The Parties shall make appropriate arrangements to cover liability risks for any collaborative activities involving product research and development.

8. Compliance with WHO Policies

By entering into this MoU, ASHRAE acknowledges that it has read, and hereby accepts and agrees to comply with, the WHO Policies (as defined below). In connection with the foregoing, ASHRAE shall take appropriate measures to prevent and respond to any violations of the standards of conduct, as described in the WHO Policies, by its employees and any other natural or legal persons engaged or otherwise utilized to perform any Project activities under the MoU. Without limiting the foregoing, ASHRAE shall promptly report to WHO, in accordance with the terms of the applicable WHO Policies, any actual or suspected violations of any WHO Policies of which ASHRAE becomes aware. For purposes of this MoU, the term "WHO Policies" means collectively: (i) the WHO Code of Ethics and Professional Conduct; (ii) the WHO Policy on Preventing and Addressing Sexual Misconduct; (iii) the WHO Policy on Preventing and Addressing Abusive Conduct; (iv) the WHO Code of Conduct for responsible Research; (v) the WHO Policy on Whistleblowing and Protection Against Retaliation; (vi) the WHO Policy on Prevention, Detection and Response to Fraud and Corruption, and (vii) the UN Supplier Code of Conduct, in each case, as amended from time to time and which are publicly available on the WHO website at the following links: <http://www.who.int/about/finances-accountability/procurement/en/> for the UN Supplier Code of Conduct and at <http://www.who.int/about/ethics/en/> for the other WHO Policies.

9. Zero tolerance for sexual misconduct and other types of abusive conduct

WHO has zero tolerance towards any form of sexual misconduct, which includes sexual exploitation, sexual abuse, sexual violence, and sexual harassment, and other types of abusive conduct. In this regard, and without limiting any other provisions contained herein, each Party warrants that it shall: (i) take all reasonable and appropriate measures to prevent sexual misconduct as described in the WHO Policy on Preventing and Addressing Sexual Misconduct and/or other types of abusive

conduct as described in the WHO Policy on Preventing and Addressing Abusive Conduct by any of its employees and any other persons engaged by it to perform any services under the MoU, and, in the case of the other Party, (ii) promptly report to WHO and respond to, in accordance with the terms of the respective Policies, any actual or suspected violations of either Policy of which the other Party becomes aware.

10. Anti-Terrorism and UN Sanctions; Fraud and Corruption

ASHRAE warrants for the entire duration of the MoU that:

- (i) it is not and shall not be involved in, or associated with, any person or entity associated with terrorism, as designated by any UN Security Council sanctions regime, that it shall not make any payment or provide any other support to any such person or entity and that it shall not enter into any employment or other contractual relationship with any such person or entity;
- (ii) it shall not engage in any fraudulent or corrupt practices, as defined in the WHO Policy on Prevention, Detection and Response to Fraud and Corruption, in connection with the implementation of the Project;
- (iii) it shall take all necessary measures to prevent the financing of terrorism and/or any fraudulent or corrupt practices as referred to above in connection with the implementation of the Project; and
- (iv) it shall promptly report to WHO, through the WHO Integrity Hotline or directly to the WHO Office of Internal Oversight Services (IOS), any credible allegations of actual or suspected fraudulent or corrupt practices, as defined in the WHO Policy on Prevention, Detection and Response to Fraud and Corruption of which the contractor becomes aware and respond to such allegations in an appropriate and timely manner in accordance with its respective rules, regulations, policies and procedures. Furthermore, ASHRAE agrees to cooperate with WHO and/or parties authorized by WHO in relation to the response. Relevant information on the nature of any credible allegations of such actual or suspected violations, as well as the details of the intended response and the outcome of any such response, should be communicated and coordinated with WHO, with the understanding that, subject to the terms of the WHO Policy on Prevention, Detection and Response to Fraud and Corruption, Confidentiality, and the due process rights of those involved will be respected.

11. Breach of essential terms

ASHRAE acknowledges and agrees that each of the provisions of article 8 (Compliance with WHO Codes and Policies), article 9 (Zero tolerance for Sexual Misconduct), and article 10 (Anti-Terrorism and UN Sanctions; Fraud and Corruption)

above constitutes an essential term of this MoU and that in case of breach of this provision, WHO may, in its sole discretion, decide to terminate this MoU and/or any other agreement concluded by WHO with ASHRAE , immediately upon written notice to ASHRAE, without any liability for termination charges or any other liability of any kind.

12. Use of the Parties' names

Except as explicitly provided in this MoU, neither Party shall, in any statement or material of a promotional nature, refer to the relationship of the other Party to the collaboration pursuant to this MoU, or otherwise use the other Party's name, acronym and/or emblem, without the prior written consent of the other Party.

13. Relationship of the Parties

For the purposes of this MoU, each Party is an independent contractor and not the joint venturer, agent, or employee of the other Party. Neither Party shall have authority to make any statements, representations, or commitments of any kind, or to take any action which shall be binding on the other Party, except as may be explicitly provided for in this MoU or any subsequent agreements or authorized in writing by the other Party.

14. Termination

This MoU may be terminated by either Party, subject to three (3) months' advance written notice to the other Party. Notwithstanding the foregoing, it is agreed that any termination of this MoU shall be without prejudice to: (i) the orderly completion of any ongoing collaborative activity; and (ii) any other rights and obligations of the Parties accrued prior to the date of termination of this MoU.

The term of this Memorandum of Understanding shall begin when signed by both parties and shall terminate at the end of three (3) years unless extended at that time by written agreement.

15. Amendments

This MoU may only be amended in writing by mutual consent of the Parties.

16. Settlement of disputes

Any dispute relating to the interpretation or execution of this MoU, or of any subsequent exchange of letters or agreement with respect to individual collaborative activities shall, unless amicably settled, be subject to conciliation. In

the event of failure of the latter, the dispute shall be settled by arbitration. The arbitration shall be conducted in accordance with the modalities to be agreed upon by the Parties, or in the absence of agreement, in accordance with the rules of arbitration of the International Chamber of Commerce. The Parties shall accept the arbitral award as final.

17. Privileges and Immunities of WHO

Nothing contained herein shall be construed as a waiver of any of the privileges and immunities enjoyed by WHO under national or international law, and/or as submitting WHO to any national court jurisdiction.

Agreed and accepted:

For the World Health Organization

For ASHRAE

Signature:

Signature:

Name:

Name:

Title:

Title:

Date:

Date:

Region/Chapter Publications Policy
REPORT TO Planning Committee
ASHRAE Winter Conference, Atlanta
February 2023

Working Group Members

Wade Conlan
Stephanie Reiniche
Mark Owen

INFORMATIONAL ITEMS

1. The intent of this effort was to evaluate and determine an approach to allow for Chapters or Regions to submit a document that they have created. The goal was to determine what type and amount of ASHRAE Logos or Names should be on said document as well as to determine the level of disclaimers on the document. The request was for this process to be quick so that Chapters and Regions who create materials do not have to wait the normal length of time for documents to be formally published.
2. The Team met multiple times to review the existing processed in place, which includes the Special Publications "Request for Review" online submission.
 - a. Discussion was that depending on the number of submissions that were to be received, there would need to be additional staff added to Publications and Technology.
 - b. IT Staff time would be required to modify the Request Review Form to accommodate the information that would be needed in this process that is different. A temporary marked up form is in Attachment 21A-1 – "Request Form for New Publications and Review and Approval for Grassroot and Technical Group Publications."
3. A flow chart was created to show the step-by-step process and proposed timeline to receive the submission and evaluation completed.

Work Flow and Time for Document Review Submitted by Chapter	
Submit the Document	
<ol style="list-style-type: none"> 1. Complete the Cover Sheet (based on the PubEd Review Request Online) 2. Cover Sheet is - Request Form for New Publications and Review and Approval for Grassroot and Technical Group Publications (see another document) 	
Director of Publication and Education	Manager of Technical Services
<ol style="list-style-type: none"> 1. Issue to the document submitter the required disclaimers and rules for adding logos. Likely to be no Logo at start of review process. 2. Complete within 5 days of submission. 3. Start the Plagiarism Review. 	<ol style="list-style-type: none"> 1. Review the Selected Functional Groups (TC/SPC/MTG/GPC/PDC) 2. Completed and send to appropriate groups in 8 days.
Functional Groups	
<ol style="list-style-type: none"> 1. Review documents and provide comments. Similar to PDC Review process or ASHRAE Journal Process. 2. 30 days to complete review and send back to Manager of Tech Services 	
Editor, Special Publications	Manager of Technical Services
<ol style="list-style-type: none"> 1. Review comments 2. Completed Plagiarism Review 3. Determine appropriate level of Logos and Disclaimers 	<ol style="list-style-type: none"> 1. Review comments. 2. Notify Director of Publication and Education of Review with its comments.
Manager of Technical Services	
<ol style="list-style-type: none"> 1. Compile comments from Plagiarism Review and Working Group Review 2. Issues direction for revision or acceptance, including new levels of Logos and Disclaimers to be used. 	
Submitter of Document	
<ol style="list-style-type: none"> 1. Review comments and determine if they will re-submit. 2. Update document for Logo and Disclaimer. 3. Acknowledgement of review within 14 days and send updated version to Editor of Special Publications and Manager of Technical Services, with the link to where it is posted on the web, for record purposes. 	

4. Some added thoughts on the steps in this process and working details:
 - a. Submitters must select the Functional Groups they believe should be reviewing this document. This is in way to have them start to think about working with the cognizant bodies for the technical information generated by ASHRAE.
 - i. This would be checked and expanded by ASHRAE Staff to ensure the proper Functional Groups perform the review.
 - b. When emailing the Functional Group, the following people would be copied:
 - i. FG Chair and Vice Chair
 - ii. TC would include TAC Chair and Vice Chair and Section Heads
 - iii. Std would include Std Chair and Vice Chair and SPLS Liaisons
 - iv. PD would include TechC Chair and Vice Chair, DRSC Chair, and PDC Chair
 - c. Review by FG is for alignment with other ASHRAE technical content and not grammar, spelling, etc. Comments should be made to keep them in line with those documents.
 - d. ASHRAE Logo use would require the full Publication Review Process that would occur if the Submitter would like that logo and not just their chapter logo.
 - i. During review it is felt that the Chapter Logo should not be on the document and a disclaimer stating it is the author's opinion and not ASHRAE statements.
 - e. This could be applied to a TC driver document, like TC 9.7, or to a Chapter (like the BC Chapter).
 - f. Publication and Education to determine the disclaimers and logo use for four intervals:
 - i. Upon Submission and During Review – No Logo but Disclaimer
 - ii. Review with no changes
 - iii. Review with changes
 - iv. Formal Publication review / plagiarism to get the use of the ASHRAE Logo
5. Part of the discussion also centered around training the chapters and the functional groups who would now be part of this process.
 - a. Upon submission, one of the trainers will get with the Chapter to show them the process for submitting for changes and working with Functional Groups.
 - b. Training for Chapters and Submitters would include the following:
 - i. Info on Functional Groups and where they are in ASHRAE.
 1. FG's TPS in an organized manner
 - ii. Interactive database for FG and documents they are cognizant as well as the Handbook chapters with cognizant for the reviewing to understand who to select when they review
 - iii. Current paths to comment on documents – Handbook, Guideline, Standards
 1. When out for public review
 2. When not out for public review
 - c. Training for Functional Groups
 - i. Why this process is being created.
 - ii. Levels of Review to be completed and intent.
 - iii. Levels of Logos to be discussed.

Commented [RS1]: Do we want Grassroots creating PDs? Or are you thinking (drawing a blank) this would be based on the Society PD?

Commented [TBD2R1]: This is if the topic touches on a PD that they can be asked to comment on what was submitted. Many people, such as the Lancet Report, points to the PDs and try and repeat what it states. We want that checked.

Attachment 21A-1 – “Request Form for New Publications and Review and Approval for Grassroot and Technical Group Publications.”

Request Form for New Publications and Review and Approval for Grassroot and Technical Group Publications

Members of ASHRAE at the Grassroots level, Society committees and others can use this form to submit ideas for new publications or to give ASHRAE early notice of a prospective publication. Also use this form to submit your publication for review by Society prior to publishing or to request help with preparation of a publication.

ASHRAE's Publications Committee evaluates the suitability of proposed topics based on the value of a proposed publication to the membership, the size of the expected audience, and the potential to recover publishing costs through sales of the publication. Topics for special publications may originate from ASHRAE research projects, from unsolicited proposals, or by referrals from Publishing and Education Council. When reviewing unsolicited material, the committee maintains confidentiality regarding the material submitted, if requested.

Proposals must be submitted at least 60 days before an ASHRAE conference to be considered by the Publications Committee at that conference.

For each proposed publication, the committee requests that a cognizant ASHRAE Technical Committee (TC) agree to oversee production, review, and/or approval of the technical content. For publications originating from ASHRAE research projects, the technical committee responsible for managing the research project also manages the technical content.

Following review and approval of the final technical content by the cognizant committee, ASHRAE Special Publications staff edits and formats the manuscript for publication.

Requests for review of publications created by Grassroots or Society committees must be submitted xx days prior to publishing for review by Publications staff for copyright permissions/plagiarism and review by Technology Staff and related technical committees for Technical Review.

Expression of Interest or Intent to Prepare a Special Publication

Fields with a *** are required.

*** Submitted by:

Date submitted:

*** Proposed Title:

Author(s):

***Format of document (book, pamphlet, software, chart video, app, etc.):

*** If a book, what type of book will it be? a) design guide, b) application guide, c) textbook, d) introduction for beginners, e) niche publication for specialized group, or f) other (please explain).

Estimate its size and describe its complexity:

*** What information or topics will this publication contain?
Please provide detailed, chapter-by-chapter outline.

Click "Choose File" below to upload supporting files if you have any.
Allow file types: ('txt','pdf','xls','xlsx', 'doc', 'docx', 'jpg', 'png', 'jpeg')

Do you intend to include any other materials with the publication, such as spreadsheets that do calculations, additional reading material not to be contained in the book, videos, etc? If so, please describe the additional materials.

Yes No

*** Do you intend for the book to include a glossary and/or an index?

Glossary Index Neither

*** Why is this publication needed?

Commented [RS3]: Insert a row above is this a request to publish by grassroots or by a technical committee? Yes, no

Commented [RS4R3]: If no you would go to the format question, if yes skip to (auto skip down below)

*** Who is the potential audience?

*** Are there similar books already on the market? If so, how would this one be different compared to its competitors?

*** TC(s) willing to serve as cognizant committee(s): TC(s) willing to serve as cognizant committee(s): (Please attach the text of an email in Word or the meeting minutes as proof of TC willingness.)

Click "Choose File" below to upload supporting files if you have any.
Allow file types: ('txt','pdf','xls','xlsx', 'doc', 'docx', 'jpg', 'png', 'jpeg')

Other TCs or ASHRAE Committees that may be interested in this:

Development/funding of this publication will be done (check all that apply):

- As a volunteer effort requiring no additional funding.
- By contract with author(s) in exchange for a royalty on sales.
- Using funding from (complete all that apply):
 - ASHRAE Research (please provide project number, if available):
 - Other nonprofit association (please specify):
 - Trade association (please specify):
 - Commercial source(s) (please specify):
 - Government (please specify):
 - Other (please specify):

Commented [TB5]: Document

Commented [RS6]: Add the following questions:

1. Do you have permissions for all graphics, etc? Click "choose file" to upload supporting documents. This is required for the use of any ASHRAE logo.
2. What TC committees have SMEs that would be appropriate to review the material for technical consistency?
3. Is this publication consistent with ASHRAE Society publications, positions, etc? Which documents were reviewed? Please list/
4. If not consistent please explain why.

Commented [TB7]: This will ask which Functional Groups should be considered for review - pull down list with all TCs / SPCs/ GPCs /MTGs / Other

Submitter must select

*** Estimated completion date:

Commented [RS8]: Requested review completion date (must be 30 business days out)

Do you need support from ASHRAE (e.g. writing, proofreading, editing, advice on formatting, suggested reviewers, research)?

Commented [RS9]: Add check box to click that you have submitted the draft

Please click here to confirm that you understand a) that the book must be published in dual units, b) that text from other sources must be cited appropriately (in the text, full citations in the References section), c) that you must supply separate image files (jpg, tiff, eps, bmp) for all figures to be included in the book, and d) that you must obtain permission from copyright holders to reprint any images already published in print or online.

Commented [RS10]: We might need to tweak this

Contact information

A copy of your submission will be sent to the email address you enter below.
Who will be the primary contact?

Name:

Email address:

Mailing address:

City/State/Zip:

Country:

Phone:

Fax:

Please enter the text from the image

N5aSZX





Shaping Tomorrow's Built Environment Today

Building Electrification

THE ISSUE

Building electrification is often viewed as an important strategy for [building decarbonization](#), but electrification, in and of itself, does not necessarily guarantee decarbonization. Building electrification refers to transitioning all or portions of building systems to electricity instead of on-site fossil fuel-based, non-electric energy. Space and water heating, some chilled water generation, snow melt, cooking, laundry, and emergency power backup commonly use on-site fossil fuel-based energy.

Electrification contributes to decarbonization when: (1) the electricity comes from low- or zero-carbon energy sources such as solar, wind, tidal/wave, hydro, and nuclear; or (2) when the efficiency of the new low-carbon equipment results in overall GHG emissions reductions compared to on-site combustion. Therefore, action is needed by both the buildings and the electric grid sectors. Utilities must achieve their grid decarbonization goals by transitioning to low- or zero-carbon generation. Some regional grids have already decarbonized significantly, putting building electrification on a “fast track” toward total building decarbonization.

The growth of building (and transportation) electrification could require a significant increase in electrical grid capacity, emphasizing the need for energy efficiency, energy storage, grid interactive building design, and alignment of consumption with carbon-free generation (i.e., demand flexibility) to minimize the increase in peak demand. Building electrification can present embodied carbon, capital and operating cost challenges; it also provides an opportunity to improve air quality, especially in densely populated areas by reducing particulate pollution and ground-level ozone from fossil fuel combustion. Many innovative energy efficient buildings with all-electric systems are already being built and occupied. Existing buildings' ability to electrify cost-effectively will accelerate with technological improvements and local and national policy incentives.

ASHRAE's ROLE

ASHRAE stands at the forefront in supplying standards, guidance, and education for the design, manufacturing, installation, and operation of building systems. These resources can also provide governments with a technical foundation for beneficial building electrification policies. ASHRAE's relevant consensus-based standards include new proposed standards and those being updated to specifically reflect decarbonization:

- Standard 90.1, *Energy Standard for Buildings Except Low-Rise Residential Buildings*
- Standard 90.2, *Energy-Efficient Design of Low-Rise Residential Buildings*
- Standard 100, *Energy Efficiency in Existing Buildings* (Note: This Standard is being updated as the *Energy and Emissions Building Performance Standard*)
- Standard 105-2021, *Standard Methods for Determining, Expressing and Comparing Building Energy Performance and Greenhouse Gas Emissions*
- Proposed Standard 228P, *Standard Method of Evaluating Zero Net Energy and Zero Net Carbon Building Performance*

- Proposed Standard 240P, *Evaluating Greenhouse Gas (GHG) and Carbon Emissions in Building Design, Construction and Operation*
- Proposed Guide, *Heat Pump Application, Design, and Operation for Decarbonization*
- Multiple technical resource guides being developed by ASHRAE's Task Force for Building Decarbonization

ASHRAE's VIEW

ASHRAE supports the global need to reduce emissions from buildings, including through beneficial electrification. ASHRAE encourages policymakers to consider the following:

1. Transitioning away from fossil-fueled appliances to high-efficiency all-electric appliances and technologies can significantly reduce greenhouse gas (GHG) emissions from buildings using low carbon intensity electricity, but also needs to review the embodied carbon requirements in whole life carbon evaluations. This shift away from use of fossil-fueled appliances, combined with an increasingly clean grid, has the potential to improve air quality inside of a building as well as outside.
2. Widespread electrification of building heating and domestic hot-water systems could require a substantially larger electrical grid infrastructure, unless there is a substantial reduction in building energy use through energy efficiency, storage, and demand flexibility through smart building-grid integration.
3. New equipment will utilize much lower global warming potential (GWP) refrigerants. While existing equipment may still use high GWP refrigerants, supporting and implementing phase-out plans and refrigerant management will dramatically reduce the impact of refrigerant leakage on overall building GHG emissions. Switching natural gas to heat pumps needs to take account of the impacts of refrigerant changes.
4. The ability of buildings to interact with the electric grid can help maximize the use of low- or no-carbon electricity and on-site energy storage to reduce operating costs. Two-way communication between the electrical grid and building enables both sides to save money, decrease emissions and improve service reliability.
5. Heat pumps have become more energy efficient and capable of generating much higher temperatures, improving compatibility with existing heating distribution systems and improving their effectiveness in cold climates.
6. Promotion of operational carbon emissions analysis and reporting in building codes.
7. Building electrification strategies should not compromise indoor environmental quality or safety, and should consider the balance of energy efficiency, cost, and environmental impacts.
8. Building electrification, and decarbonization more broadly, represents a significant paradigm shift in the design and construction industry, requiring support for workforce training for all who create and operate buildings.
9. Hybrid (partial) electrification retrofits can be beneficial where heating load profiles currently make complete electrification currently uneconomical.
10. Because replacement of fossil-fuel heating equipment before end-of-life can have a negative impact on embodied carbon and refrigerant emissions, electrification retrofits should be analyzed from a whole life cycle carbon perspective and phased over time if necessary.
11. Renewable fuels (e.g., renewable gas, hydrogen, biomass) should be considered in existing building retrofits, depending on local availability and system requirements.

REPORT TO THE BOARD OF DIRECTORS
From the Planning Committee
February 5, 2023

Recommendations for Board Approval:

1. MOTION: Planning Committee recommends to the Board of Directors that the 2019-25 Strategic Plan be revised as presented in **ATTACHMENT A** to include additional elements of decarbonization.

BACKGROUND: The Task Force for Building Decarbonization (TFBD), at the request of the ASHRAE President, reviewed the current strategic plan to determine how the plan could be edited to include a greater decarbonization focus. After much discussion, edits that have been presented represent the removal of initiative 1 regarding resiliency to be replaced with building decarbonization.

There were originally two motions made during the meeting regarding the changes. The first motion was to approve the changes. The second motion was to change the title of initiative 1 to *Resilient Buildings and Decarbonization*. Both motions were approved as noted below:

PASSED: 7:3:0 (CV)

PASSED: 6:0:4 (CV)

FISCAL IMPACT: None

Information Items:

1. The Planning Committee distributed a member survey in the fall of 2022. Results of the survey are presented in **ATTACHMENT B**. Additional details regarding the survey can also be found at the link below:

Link: <https://file.ac/4fKeZAJnCng/>

The intent of the survey was to determine member satisfaction, member reasons for participating in ASHRAE, and other organizational involvement of members to provide valuable feedback regarding how ASHRAE can better serve its members.

Main takeaways from the survey are as follows:

- Access to technical resources, learning and training included and keeping updated about the latest industry trends are considered the main reasons for being an ASHRAE member
- Handbook, publications, standards and chapter meetings and events are considered the most valuable services ASHRAE provides
- Most ASHRAE members pay or would pay for their membership
- Members select Energy Security, Climate Change Mitigation and Decarbonization as the main critical issues of our industry. Increasing decarbonization awareness and design guide development being mentioned as the main challenges to address
- Members would like to attend more Chapter meetings and ASHRAE Conferences in-person compared to their responses last year.

Recommendations for how Society should move forward based on survey results are as follows:

- Track trends and additional comments about opportunities/challenges ASHRAE would need to address in the future:
 - Item #1 –Focus on content of technical/valuable resources/services
 - Item #2 –Focus on building decarbonization: tools and information

Additional actions for the Planning Committee to close out this year's membership survey task are noted below:

- Continue Focus on Improving Response Rate (6.2% this year)
 - Explore an enhanced marketing campaigns (extra involvement/support from regional leaders (DRC's and Chapter BOG), discuss survey at Spring & Fall CRC's)
 - Dedicated funding for survey incentives

- Send a Letter of Appreciation to Respondents
 - Include link to the survey results summary posted on the ASHRAE website
- Collect Information from Industry Leaders:
 - Likely through a different method (possibly one on one discussions)
 - Industry Leaders could include:
 - Non-active ASHRAE members that lead organizations
 - Non-ASHRAE members with knowledge about ASHRAE mission and vision
 - Other related associations members

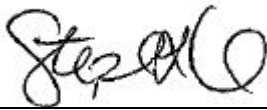
The Committee is planning to send the next survey in the fall of the 2023.

As a part of this discussion, the committee briefly noted that the survey may need to be sent to another entity such as Members Council. A final decision will be made in the coming months regarding which group should own the survey.

2. The committee discussed the length of the next strategic plan. There was consensus that the next plan should be 3 years in length. There was much discussion as many felt the plan should also include a long-range aspect as it is being shortened.

Change in length of the plan is noted as an informational item as ROB Section 2.101.008.2 notes that the life of strategic plans is typically five years or less.

The engagement of a consultant during the next strategic plan development cycle was also heavily discussed. As the committee has decided to move forward with contracting a consultant, a draft RFP was reviewed. The draft RFP is scheduled to be sent to potential consultant firms within the next several weeks.



Chair

February 5, 2023

Date

- Attachments:
- A. 2019-2025 - Strategic Plan Midterm Update (Includes proposed edits)
 - B. 2022 ASHRAE Member Satisfaction Survey Presentation PLC Meeting 2023 WC



2019–2025 ASHRAE Strategic Plan Midterm Update



Prepared by ASHRAE Planning Committee
Approved by ASHRAE Board of Directors, May 6, 2019
Midterm Update Approved by ASHRAE Board of Directors, November 17, 2021

2017-2018 ASHRAE Planning Committee

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Thomas H. Phoenix, P.E., Vice Chair Michael
P. Cooper, P.E.
Jennifer A. Isenbeck, P.E.
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2014 Strategic Plan Tracking Subcommittee
Karine Leblanc
Sarah E. Maston, P.E.
William F. McQuade, P.E., LEED AP, Chair,
2019 Strategic Plan Development
Subcommittee
Sarah Poursharafeddin
Ashish Rakheja Hassan
Ali Sultan

Timothy G. Wentz, P.E., Chair,
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Michael C.A. Schwedler, Coordinating Officer Jeff H.
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BOD Consultant
Marites Dagulo Calad, BOD Consultant Tim J.
McGinn, P.E., BOD Consultant Daniel R.
Rogers, P.E., BOD Consultant
W. Stephen Comstock, Staff Director
Vanita Gupta, Staff Director
Mary Dean Townsend, Staff Liaison

2021-2022 ASHRAE Planning Committee

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David Arnold, Ph.D.
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Trenton S. Hunt, Chair, Implementation
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Dunstan Laurence Macauley, III
Jeff H. Littleton, Executive Vice President
Stephanie C. Reiniche, Staff Director
Chandrias Jolly, Staff Liaison

Additional edits outside of the 1st motion to approve noted in **blue**

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INTRODUCTION

This plan, developed by the ASHRAE Planning Committee in collaboration with the Board of Directors, will guide the work of the Society during the five-year period from 2019-2024. It was developed during 2018-2019 through a process initiated by a stakeholder engagement exercise involving members of ASHRAE and key industry organizations who gave their views on ASHRAE's position in the industry and its perceived strengths and challenges. With facilitation by the Planning Committee, the Board then conducted a brainstorming session to develop preliminary objectives and initiatives. These addressed both outward-facing issues affecting the industry and society as well as inward-facing issues related to the needs of ASHRAE members and organizational efficiency. The final plan was drafted by the Planning Committee with Board oversight following multiple reviews including review by regional leadership teams. The final phase of development was preparation of implementation and tracking procedures, roll-out plans and budget estimates. Communication of the new plan to councils and committees began in Spring 2019 with formal implementation beginning in July 2019.

2021 MIDTERM UPDATE AND 1-YEAR EXTENSION

In Spring 2021, the Board of Directors approved a midterm update and one-year extension of the 2019-2024 Strategic Plan. This update was recommended by the 2020-2021 Planning Committee due to recent events that altered how the Society completes its work and serves the industry. Revisions to the 2019-2024 Strategic Plan include lessons learned during the COVID-19 pandemic as well as rebooted/restarted initiatives to redirect resources.

Initiatives and goals reviewed were addressed in a way that would allow ASHRAE councils and committees to make significant traction with the already assigned tasks while considering any work in progress or already completed. Feedback from the Planning Committee liaisons assigned to each of the Presidential Ad Hocs was also taken into consideration to ensure efforts regarding the streamlining initiatives were addressed.

MISSION, VISION AND VALUES

As part of the Strategic Plan development process, the Planning Committee recommended that the Mission and Vision statements be revised to reflect ASHRAE's current work and aspirations more clearly. No changes were recommended to ASHRAE's Core Values.

Mission

To serve humanity by advancing the arts and sciences of heating, ventilation, air conditioning, refrigeration and their allied fields.

Vision






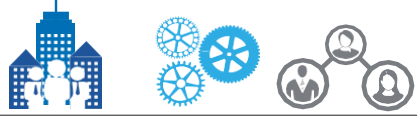


A healthy and sustainable built environment for all.

Values

- Excellence
- Integrity
- Volunteerism
- Commitment
- Collaboration
- Diversity

GOALS AND OBJECTIVES

ASHRAE’s leadership has identified **three goals**: to advance the industry, provide value to ASHRAE members and prepare the Society for the future and **objectives** that support each goal. **Four initiatives** have been identified to respond to these goals and objectives as shown in the table below. The initiatives are described in detail on the next page (p. 7).

GOAL 1 Position ASHRAE as an Essential Knowledge Resource for a Sustainable, High-Performance Built Environment	
OBJECTIVES	INITIATIVES
a. Utilize a holistic approach to ASHRAE’s offerings and activities to drive positive economic, environmental and social impact through innovation in building design and operations	
b. Expand capabilities globally to create, aggregate and disseminate essential information and knowledge focusing on emerging market trends and transformative approaches	
GOAL 2 Maximize Member Value and Engagement	
OBJECTIVES	INITIATIVES
a. Infuse enthusiasm, vitality and diversity throughout ASHRAE events and services	
b. Expand the impact of collaboration and partnerships with industry organizations, universities and government agencies	
c. Leverage technology to increase member engagement, awareness and value	
GOAL 3 Optimize ASHRAE’s Organizational Structure to Maximize Performance	
OBJECTIVES	INITIATIVES
a. Prototype and launch new approaches that will increase ASHRAE’s relevance and speed to market for key offerings	
b. Optimize ASHRAE’s organizational systems and structures to increase capacity, efficiency and effectiveness	
c. Cultivate industry and member philanthropy to extend ASHRAE’s impact and reach	

KEY	 Resilient Buildings and Communities	 Indoor Environmental Quality	 Organizational Streamlining	 Improve Chapter Engagement, Capacity and Support

STRATEGIC PLAN AREAS AND INITIATIVES

Initiatives provide a focus for the Society to drive advancement

Initiative Area: Built Environment of the Future

1 RESILIENT BUILDINGS and COMMUNITIES

The cycle of building development, design and construction is moving more rapidly than ever. Key stakeholders in the design, construction, and operation of buildings face new challenges of responding to a range of environmental, market and consumer-driven pressures. Increasingly, it is being recognized that “smart” buildings and integrated systems are central to successfully addressing challenges posed by climate change, natural disasters, accidents, disease and terrorism. ASHRAE must stimulate innovation and exploration related to these challenges, and promote best practices that enable adaptability, resilience and recovery of buildings and communities.

2 INDOOR ENVIRONMENTAL QUALITY

The indoor environment is increasingly recognized as the leading priority for built environment, with implications extending beyond simple acceptability of indoor conditions to its influence on productivity, learning and health. The indoor environment of the future identifies and optimizes interactions among air quality, thermal comfort, lighting and acoustics, based on a firm understanding of implications for occupants’ health and wellness. ASHRAE convenes and collaborates with experts and stakeholders across the industry to engage in discussion and exploration of this topic to accelerate collective knowledge in the field. This initiative aims to elevate ASHRAE’s role in facilitating this discussion, generating thought leadership and promoting understanding of indoor environmental quality (IEQ) among practitioners.

Proposed Edit for Initiative 1:

INITIATIVE 1 RESILIENT BUILDINGS AND DECARBONIZATION

The pace of change in building design, development, construction, and operation is increasing rapidly, driven by increasing global challenges associated with increasing building-related GHG emissions. By 2030, all new buildings must be built to achieve net zero operational GHG life cycle emissions, with all existing buildings retrofitted to net zero emissions standards by 2050. ASHRAE must work with building industry partners to accelerate innovation, define global best practices, and develop technical guidance, standards, training, and other tools to support building decarbonization while assuring high levels of indoor environmental quality, sustainability, and resilience.

and resources to the most impactful pursuits. This initiative intends to improve internal governance, volunteer and staffing structures to ensure a strong connection across the societal organization and its chapters around the globe.

4 IMPROVE CHAPTER ENGAGEMENT, CAPACITY and SUPPORT

ASHRAE must evaluate and develop methods to better engage chapters, regions and the members they serve in an integrated way. A more supportive and proactive strategy for chapter and regional oversight will minimize variability and ensure that all ASHRAE members experience a strong and valuable connection to the local and societal component.

INITIATIVE 1 RESILIENT BUILDINGS and COMMUNITIES



BACKGROUND

Buildings and integrated systems are central to successfully addressing challenges posed by climate change, natural disasters, accidents, disease, and terrorism.

ASHRAE must stimulate innovation and exploration related to these challenges, and promote best practices that enable adaptability, decarbonization, resilience and recovery of buildings and communities.

Table 1 provides more detail:

TABLE 1

BUILT ENVIRONMENT OF THE FUTURE: Resilient Buildings and Communities Building Decarbonization	
Resources	In addition to normal financial resources (e.g., research and publications budgets and reserve fund), there is an opportunity for funding from government agencies, foundations, and international agencies such as the United Nations, World Bank, and other humanitarian organizations.
Benefits	<p><u>To the Society:</u> Establish a leadership role in advancing new practice paradigms and raising awareness about the importance of resilient buildings and communities. Revenue resulting from repurposing of existing guidelines, development of new content and guidelines.</p> <p><u>To the Member:</u> Access to new research results and practice tools. Association with ASHRAE mission to serve humanity.</p>
Desired Outcomes	<ol style="list-style-type: none"> 1. Establish and maintain at least two new partnerships (MoU or leverage existing partnerships) with external organizations, societies, or government agencies and collaborate on resilient buildings and communities research and the development/adoption of standards, guidelines, programs, rating systems and educational materials. 2. Develop, publish and maintain a Resilient Building or Resilient Building/Community Standard, accompanying Design Guide(s) and design tools, educational programs and materials for adoption and use in adapting to climate change in vulnerable geographic areas. 3. Benchmark and track membership awareness of resilience practices and set targets for improved awareness over the next 5 years.
Key Stakeholders	<ul style="list-style-type: none"> ▲ Contractors ▲ Engineers ▲ Architects ▲ Building Operators ▲ Relief Organizations ▲ Insurance Companies ▲ Governments ▲ Law Enforcement Agencies ▲ Financial Institutions ▲ United Nations Office for Disaster Risk Reduction ▲ Manufacturers ▲ Retailers Related ▲ Society Committees

INITIATIVE 1

RESILIENT BUILDINGS AND DECARBONIZATION

Proposed edit for Initiative 1



BACKGROUND

Eliminating GHG emissions from the built environment is essential to addressing global climate change's negative human and environmental impacts.

ASHRAE must work with building industry partners to accelerate innovation, define global best practices, and develop technical guidance, standards, training, and other tools to support building decarbonization while assuring high levels of indoor environmental quality, sustainability, and resilience.

Table 1 provides more detail:

TABLE 1

<u>BUILT ENVIRONMENT OF THE FUTURE: Building Decarbonization</u>	
<u>Resources</u>	<u>Funded through ASHRAE research and publications budgets along with ASHRAE reserve funds. The potential exists for funding partnerships with other foundations, government entities, and non-governmental organizations.</u>
<u>Benefits</u>	<p><u>To Humanity: Help reduce building greenhouse gas emissions impact on the environment resulting in reduced indoor and outdoor air pollution, lower energy consumption and costs, and improved community health and wellbeing.</u></p> <p><u>To the Society: Establish a leadership role in advancing new industry practices and raising awareness about the importance of reducing building greenhouse gas emissions and increasing community resilience. Revenue resulting from sales of standards, other publications, and educational programs.</u></p> <p><u>To the Member: Access to new research results, practices, and tools. Association with ASHRAE mission to serve humanity.</u></p>
<u>Desired Outcomes</u>	<ol style="list-style-type: none"> <u>Add to body of scientific knowledge to advance technologies and industry practices to minimize building GHG emissions while assuring high levels of building indoor environmental quality, sustainability, and resilience.</u> <u>Establish and maintain at least two new partnerships (through Memorandums of Understanding or by leveraging existing partnerships) with external organizations, societies, or government agencies to collaborate on resilient buildings and communities research and the development/adoption of standards, guidelines, programs, rating systems and educational materials.</u> <u>Develop, publish, and maintain a Whole Life Carbon Building Standard, accompanying Design Guides and design tools, educational programs and materials for adoption and use to address building decarbonization.</u> <u>Establish partnerships with key scientific, technical, government, and non-governmental organizations to advance building decarbonization research, technology, education, and policy. Seek to promote communication among researchers, practitioners, and policymakers through conferences, publications, and marketing efforts.</u>
<u>Key Stakeholders</u>	<ul style="list-style-type: none"> • <u>General Public</u> • <u>Architects</u> • <u>Financial Institutions</u> • <u>Policymakers</u> • <u>Contractors</u> • <u>Educational Institutions</u> • <u>Building Owners</u> • <u>Governments</u> • <u>Society Councils & Committees</u> • <u>Engineers</u> • <u>Manufacturers</u>



BACKGROUND

The indoor environment is increasingly recognized as the leading priority for built environment as we navigate the current pandemic, with implications extending beyond simple acceptability of indoor conditions to its influence on individual and environmental health, learning, and productivity. The indoor environment of the future identifies and optimizes interactions among outdoor air quality, indoor air quality, thermal comfort, lighting, and acoustics, based on a firm understanding of implications for occupants’ health and wellness. ASHRAE convenes and collaborates with experts and stakeholders across the industry to engage in discussion and exploration of this topic to accelerate collective knowledge in the field. This initiative aims to elevate ASHRAE’s role in facilitating this discussion, generating thought leadership and promoting understanding of indoor environmental quality (IEQ) among practitioners.

Strategically, ASHRAE created the Epidemic Task Force to develop and provide guidance surrounding Sars-COV-2 which greatly impacted the indoor air quality environment.

Table 2 provides more detail:

TABLE 2

BUILT ENVIRONMENT OF THE FUTURE: Indoor Environmental Quality	
Resources	Can be funded through technology, publishing and education budgets. Potential exists for funding partnerships with foundations and non-governmental organizations.
Benefits	<p><u>To the Society:</u> Establish leadership role in advancing new practice paradigms and improving quality of indoor environmental health for buildings and their occupants. Revenue resulting from sales of standards, other publications, and educational programs.</p> <p><u>To the Member:</u> Access to new research results and practice tools. Association with ASHRAE mission to serve humanity.</p>
Desired Outcomes	<ol style="list-style-type: none"> 1. Add to body of scientific knowledge on the relationship of IEQ to health, productivity, and well-being of building occupants and develop practical methods for estimating the economic value of improvements in IEQ such as reduced sick days, reduced health care costs, and improved student learning. 2. Develop knowledge and guidance on understanding the ability to reduce the risk to occupant’s health and wellness through different applications and adaptations of HVAC&R systems. 3. Develop an IEQ standard based on health and productivity objectives that addresses air quality, thermal environment, light, sound, and vibration in an integrated way. 4. Establish partnerships with key scientific, technical, and government organizations to advance IEQ research, technology, and policy. Seek to promote communication among researchers, practitioners, and policymakers through conferences, publications, and marketing efforts.
Key Stakeholders	<ul style="list-style-type: none"> • Policymakers • General Public • European Committee for Standardization (CEN) • Environmental Health Committee and Councils and Committees affected • International Well Building Institute • Regulatory bodies • US General Services Administration (GSA) • US Dept. of Housing and Urban Development (HUD) • International Standards Organization (ISO) • Green Building Councils • National Center for Healthy Housing • Foundations interested in wellness/health



BACKGROUND

ASHRAE is a large and complex organization with hundreds of technical, standards, and managerial committees, supported by a rich network of leaders and subject matter experts. ASHRAE will reach its potential for leadership and influence through an organizational structure that eliminates redundancy, has flexibility to adapt to regional differences, and allocates valued time and resources to the most impactful pursuits. This initiative intends to improve internal governance, volunteer, and staffing structures to ensure a strong connection across the societal organization and its chapters around the globe.

Table 3 provides more detail:

TABLE 3

FUTURE OF ASHRAE: Organizational Streamlining	
Resources	Financial contributions, which are expected to be minimal, from the operating budgets of the Councils and Standing Committees. The major resource needed will be time from our volunteer members/leaders at the grassroots and Society level, as well as staff.
Benefits	<p><u>To the Society:</u> A more flexible, efficient and effective operational framework allowing volunteer time, staff talent and other resources to be reinvested in targeted areas to drive this plan.</p> <p><u>To the Member:</u> A more accessible association that is using resources to the highest and best use to advance the profession. Ability to move to market more rapidly will result in increased credibility and relevancy of the Society with members and the industry as a whole.</p>
Desired Outcomes	<ol style="list-style-type: none"> 1. Evaluate the staff/volunteer support structure to optimize volunteer engagement, efficiency and effectiveness of the Society (e.g. volunteer time efficiency). Present and implement findings to support the delivery of key products and services (e.g. Guidelines, Standards, Research, Publications, and Programs) with less cost, reduced time to market and an advancement in market responsiveness. 2. Redesign leadership/governance structure to support increased operational efficiency and effectiveness of the organization. 3. Targeted streamlining for operational efficiency and effectiveness through reduction of overlap and optimization of quantity, scopes, and processes (e.g. merging of technical committees for cross communication, efficiency and effectiveness). 4. Increase efficiency of Winter and Annual conferences by reducing volunteer time, staff time, and financial expenditures at Winter and Annual conferences by at least 20%.
Key Stakeholders	<ul style="list-style-type: none"> • ASHRAE Membership • Industry • Leadership of the Board, Councils and Committees affected

INITIATIVE 4 IMPROVE CHAPTER ENGAGEMENT, CAPACITY and SUPPORT



BACKGROUND

ASHRAE must evaluate and develop methods to better engage chapters, regions, and the members they serve in an integrated way. A more supportive and proactive strategy for chapter and regional oversight will minimize variability and ensure that all ASHRAE members experience a strong and valuable connection to the local and societal components.

Hybrid¹ learning and meetings are an integral part of this connection.

Table 4 provides more detail:

TABLE 4

FUTURE OF ASHRAE: Improvement of Chapter Engagement, Capacity and Support	
Resources	Can be funded through Members Council budget. Other resources in place include Manual of Chapter Operations, Basecamp and www.ashrae.org/chapterresources .
Benefits	<p><u>To the Society:</u> Improve operational efficiency to enable chapters, regional leadership and the society to share resources and information more effectively. Accountability for Chapter success is clearer with standardized guidelines and performance metrics. The Society will receive additional revenue resulting from increased Chapter member recruitment and retention.</p> <p><u>To the Member:</u> Ability to more deeply and more meaningfully engage with ASHRAE’s mission.</p>
Desired Outcomes	<ol style="list-style-type: none"> 1. Use a standardized Society-wide system for collecting, recording and benchmarking Chapter-level data and performance metrics. The system will provide an efficient and streamlined process for the exchange of resources and information among Society, Regional leadership and the Chapters. 2. Develop and standardize program guidelines, training, and associated resources based on best practices for all ASHRAE Chapters where possible. When regional differences require flexibility, adapt those guidelines as needed while maintaining the desired outcome (templates, examples, CRC and centralized training). 3. Evaluate methods to “coach” new officers/chairs in each chapter on the duties of their position/role and how best to accomplish them. Also assist them in seeking coordinated collaboration with outside groups when beneficial. 4. Strengthen chapter programs, for example by expanding the Distinguished Lecturer program and reviewing the Short Course business model. 5. Develop methods for promoting the value and benefits of employee participation in ASHRAE to employers to encourage sponsorship and support.
Key Stakeholders	<ul style="list-style-type: none"> • Chapter leadership • Industry associations and organizations within and outside of the US • ASHRAE Members • Universities • A/E Firms

¹Hybrid is defined as a combination of virtual and face to face meetings.

FINANCIAL IMPACT, BUDGETING PROCESS AND RECOMMENDATIONS

The fiscal impacts of the 2019-2024 Strategic Plan are built into the ASHRAE annual budgeting process. This is done in concert with annual planning for the Society theme activities and current cost reduction efforts. The councils and committees provided updates and submitted their budget forecasts in early March 2019 to Finance Committee, Planning Committee and Executive Committee. The updates included support for the 2019-2024 Strategic Plan.

ASHRAE Executive Committee reviewed all budget forecast proposals during their Spring 2019 meeting and developed a list of program and financial priorities. Based on these recommendations, Finance Committee updated the current-year ASHRAE budget and forecasts through 2022. The Treasurer presented this budget to the Board for approval at the 2019 Annual Conference in Kansas City.

Proposals for future work for Society years 2020-2025 resulting from the Society theme initiatives, ad hoc recommendation, or council or committee program must include a minimum three-year budget analysis along with the project's fiscal impact statement and the resulting benefits to the Society. The fiscal impact analysis shall be submitted initially for approval by the Board through Finance Committee and then be updated with actual cost to date for the current fiscal year, cost since inception and updated budget forecasts for the next three fiscal years if the project is expected to extend beyond the current fiscal year. For inclusion in the next fiscal year's budget and future year's forecasts, updates shall be submitted for approval by the Board annually at the winter meeting by the council or committee responsible for the project's oversight and management.

No additional fiscal impact was implemented as a result of the extension of the Strategic Plan.



IMPLEMENTATION

The following measures will be used to assist with the implementation of the Strategic Plan.

1. **Member Satisfaction:** Member Services, under the leadership of the Planning Committee, to establish an annual member survey with consistent satisfaction metrics to allow for year-over-year evaluation of the Strategic Plan.
2. **Member Engagement and Retention:** Institute effort and imagination in developing member retention programs similar to what has been successfully implemented for new member retention activities. Institute special initiatives to increase volunteer engagement:
 - a. Planning Committee should coordinate and conduct a focused workshop/focus group exercise with Membership Promotion Committee, Chapter Technology Transfer Committee, ASHRAE Learning Institute, and Handbook Committee to develop a common collaboration and integration strategy for member retention.
 - b. Strengthen volunteer engagement at the Chapter level by expanding recommended chapter committee and subcommittee structures within Chapter Operations Manual and promote consistent annual population of the structure through the PAOE program.
 - c. Expanding chapter committee and subcommittee structures for non-North American Chapters recognizing the unique needs and opportunities for these chapters to engage chapter members.
 - d. Institute a yearly membership drive to promote and increase active membership and participation in Technical and Standards Committees.
3. **Operational Efficiency:** ExCom to study and focus on trends in the Operating Cost per Member and develop strategies and action items to bring to the Board to optimize operational efficiency.
4. **Market Responsiveness:** Pub Ed Council and Tech Council to redesign their respective product to market processes to reduce the average time to market for our products. The current average time to market of 6.8 years must be shortened if we are to stay relevant as market leaders. This metric might only be improved by concentrating on processes such as “one product at a time.”
5. **Research Leadership:** Focus on leveraging ASHRAE Research dollars with matching funds from other research partners and funding sources. This may require dedicated staff to track and manage if we are to be effective. Senior thought leadership should be engaged along with the Manager of Research, Tech Council, RAC and TAC to develop strategies and metrics to maximize the return on investment and conversion of research into practical application guidelines and standards in research topics of interest and concern to the ASHRAE membership.



2022 ASHRAE Member Satisfaction Survey Summary

Validation and Documentation Subcommittee
of Planning Committee
January 2023

Information Issues

Validation and Documentation Subcommittee Members:

- Blake Ellis, Co-Chair
- Andrés Sepúlveda, Co-Chair
- Ahmed Alaa Eldin Mohamed
- Michael Patton
- Chad Smith

Activities:

- Survey questions development: 1 month
- Avoid open ended questions
- Reach out to BOD DEI SC, PEAC and, MC
- Reminders

SY 2022-2023 MBO's:

- Member Satisfaction launch and analysis due to 2023 WC
- Use KPI's developed SY 2021-2022 and develop KPI's for next Strategic Plan due to 2023 AC

Motion:

- Fund allocation for 2022 Member Survey incentives

Adopted decisions:

- ASHRAE staff managed survey
- Survey duration, timing follow up in real time
- Grassroot campaign
- Incentives
- Development of a Marketing Campaign
- Reminder's frequency vs target groups



Marketing Campaign



Quick 5-Minute Survey

Mobile Format Survey

ASHRAE Shaping Tomorrow's Built Environment Today

Dear ASHRAE Member,

Over the past year, ASHRAE has worked hard to meet the changing needs of our members. We continually strive to bring you up-to-date industry news and informative content in the ASHRAE Journal, to provide timely and relevant professional development courses, and opportunities to participate at all levels of Society.

We hope that your membership continues to meet and exceed your needs and expectations and would appreciate your feedback so that ASHRAE can better serve you.

Please take 5 minutes to tell us what you think, by completing [this survey](#) by Friday, December 16.

[Take Survey](#)

To show our appreciation, Society will randomly select 3 survey respondents to receive \$100 off an ASHRAE product or service of your choice (such as a winter conference, publication, or course registration). Winners will be randomly selected on Tuesday, Dec. 20 and contacted via email. Please remember to include your email address on the form if you'd like to participate in the drawing.

I look forward to your valuable feedback.

Farooq Mehtob
Farooq Mehtob
2022-23 ASHRAE President

Get To Know ASHRAE

f t in

180 Technology Parkway
Pittsburgh, PA 15202
ASHRAE Website | Privacy Policy

To avoid having ASHRAE messages blocked by your mailbox software, add ashrae@ashrae.org to your address book.

This email was sent from ASHRAE because you are a member, purchased a membership, or requested to be added to our mailing list. If you are no longer receiving these updates, please contact ashrae@ashrae.org or call 800-541-2272.

Letter from Heather Platt
Gulledge Chair PC
to DRC's and Chapter
Presidents

Incentives:

- Three \$100 credits for individuals
- Onex2023 WC Registration/Chapter Highest Resp. No
- Onex2023 WC Registration/Chapter Highest Resp. Rate

2022 Annual Membership Survey

ASHRAE

Quick Five-Minute Survey

3 Participants will win \$100 off any ASHRAE Product or Service (Publications, Courses, Conferences, etc.)

Free Conference Registration*

- Awarded to Chapter with highest # of participants
- Awarded to Chapter with highest % of participants

* Winner to be selected by Chapter President and RCPC and can be used for either 100% or 50% off conference in 2023.

Dec 16 Complete by December 16, 2022



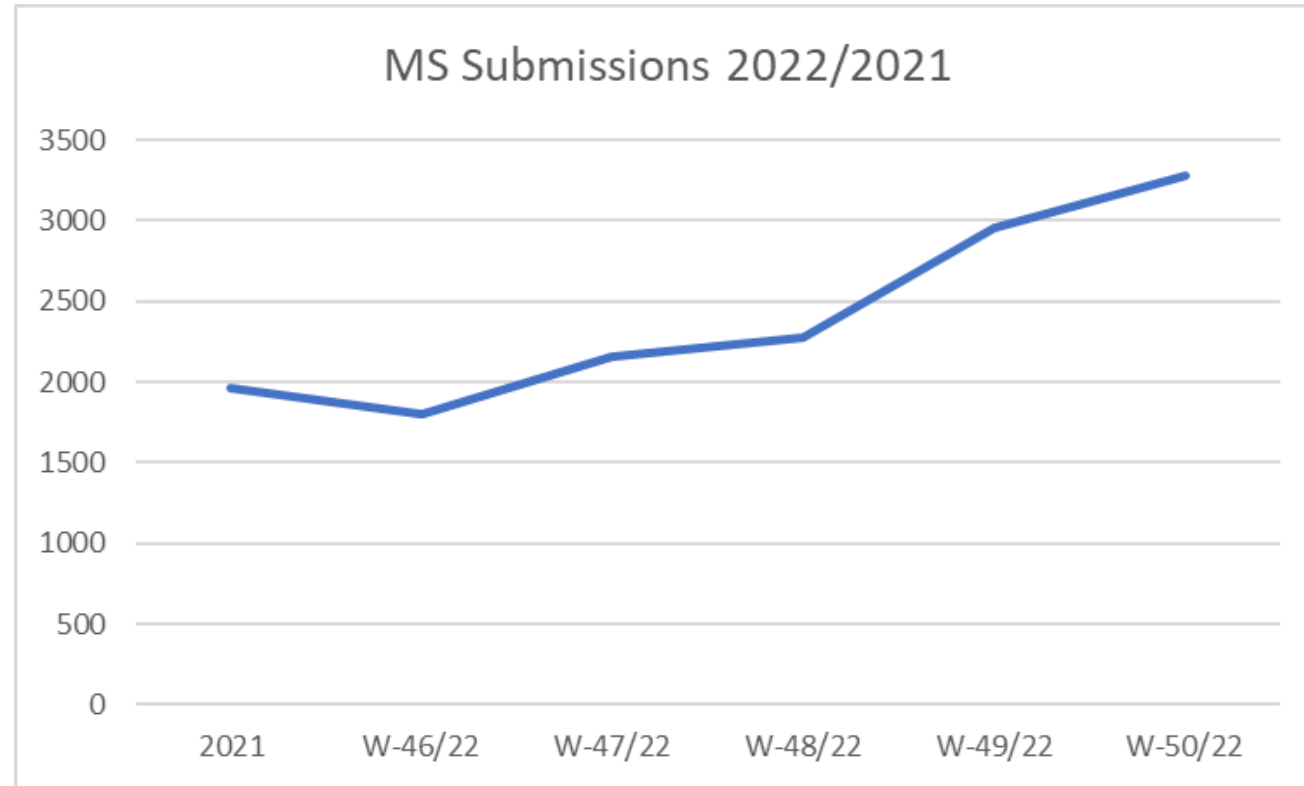
General Information

- Survey Conducted from 14 Nov. 22 to 16 Dec. 2022 (5 weeks)
- Sent to all ASHRAE members
- Incentives: rewarding three respondents and two Chapters
- Questions:
 - Some are similar to last year
 - Removed open-ended ones
 - Formulated to force a choice
 - Could be skipped
 - A final question was added asking whether there was anything else respondents would like to add



Results Summary

- Total of 3,275 Submissions
 - $\approx 6.2\%$ of ASHRAE Members
 - 1,863 in 2021, a 76% increase)
- 10-12 % question skipped average



Results Summary: Incentives

- Incentives:
 - Three \$100 credits for member respondents (Random):
 - The 3 random winners are:
 - Vince Justin Infante
 - JD Hamil
 - Jennifer Tang
 - One 2023 Winter Conference or 2023 Annual Conference Registration
 - Chapter with Highest Number of Responses
 - Boston Chapter-Region I
 - 89 Responses
 - Chapter with the Highest Response Rate
 - Western India Chapter-RAL
 - Response Rate: 51%



Main Themes

- Access to technical resources, learning and training included and keeping updated about the latest industry trends are considered the main reasons for being an ASHRAE member
- Handbook, publications, standards and chapter meetings and events are considered the most valuable services ASHRAE provides
- Most ASHRAE members pay or would pay for their membership
- Members select Energy Security, Climate Change Mitigation and Decarbonization as the main critical issues of our industry. Increasing decarbonization awareness and design guide development being mentioned as the main challenges to address
- Members would like to attend more Chapter meetings and ASHRAE Conferences in-person compared to their responses LY



Recommendations



- Continue Focus on Improving Response Rate (6.2% in 2022)
 - Explore an enhanced marketing campaigns (extra involvement/support from regional leaders (DRC's and Chapter BOG), discuss survey at Spring & Fall CRC's)
 - Dedicated funding for survey incentives
- Send a Letter of Appreciation to Respondents
 - Include link to the survey results summary posted on the ASHRAE website
- Collect Information from Industry Leaders:
 - Likely through a different method (possibly one on one discussions)
 - Industry Leaders could include:
 - Non-active ASHRAE members that lead organizations
 - Non-ASHRAE members with a knowledge about ASHRAE mission and vision
 - Other related associations members
- Track trends and additional comments about opportunities/challenges ASHRAE would need to address in the future:
 - **Item #1 – Focus on content of technical/valuable resources/services**
 - **Item #2 – Focus on building decarbonization: tools and information**





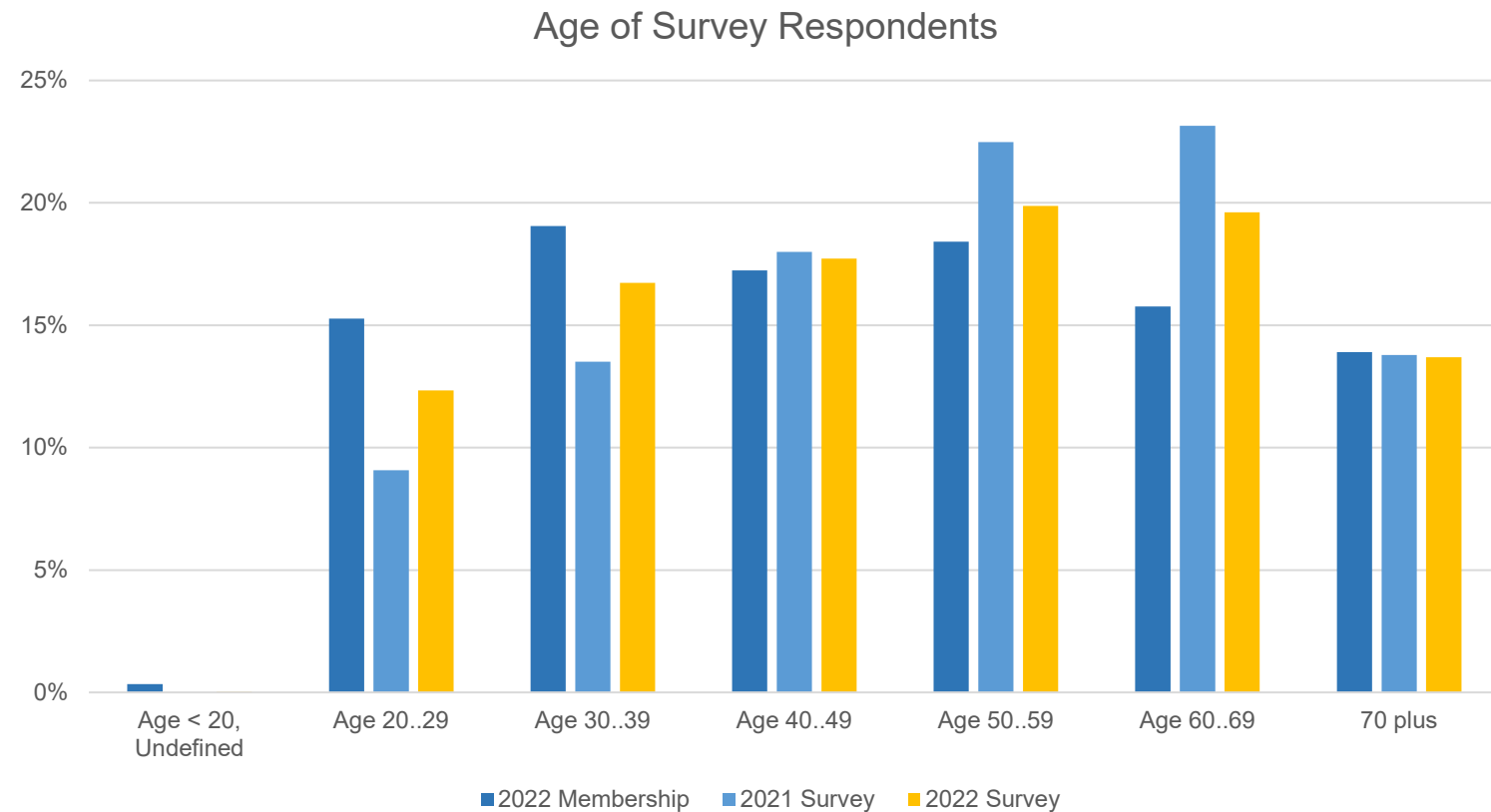
Appendix A

Demographics of Respondents

Age of Survey Respondents

Takeaways

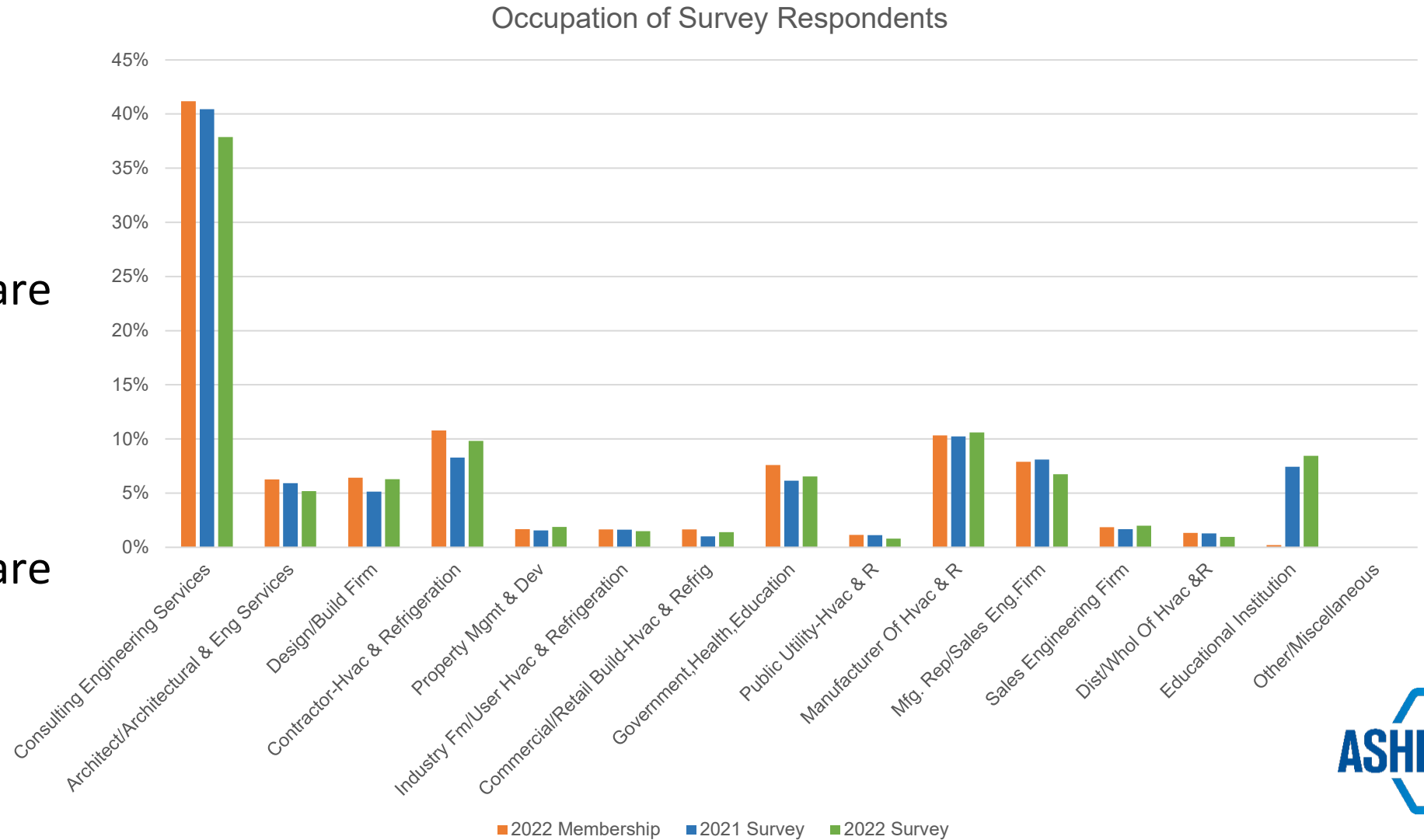
- Increased participation by younger Members
- Average survey respondent is *slightly* older than ASHRAE Membership



Occupation of Survey Respondents

Takeaways

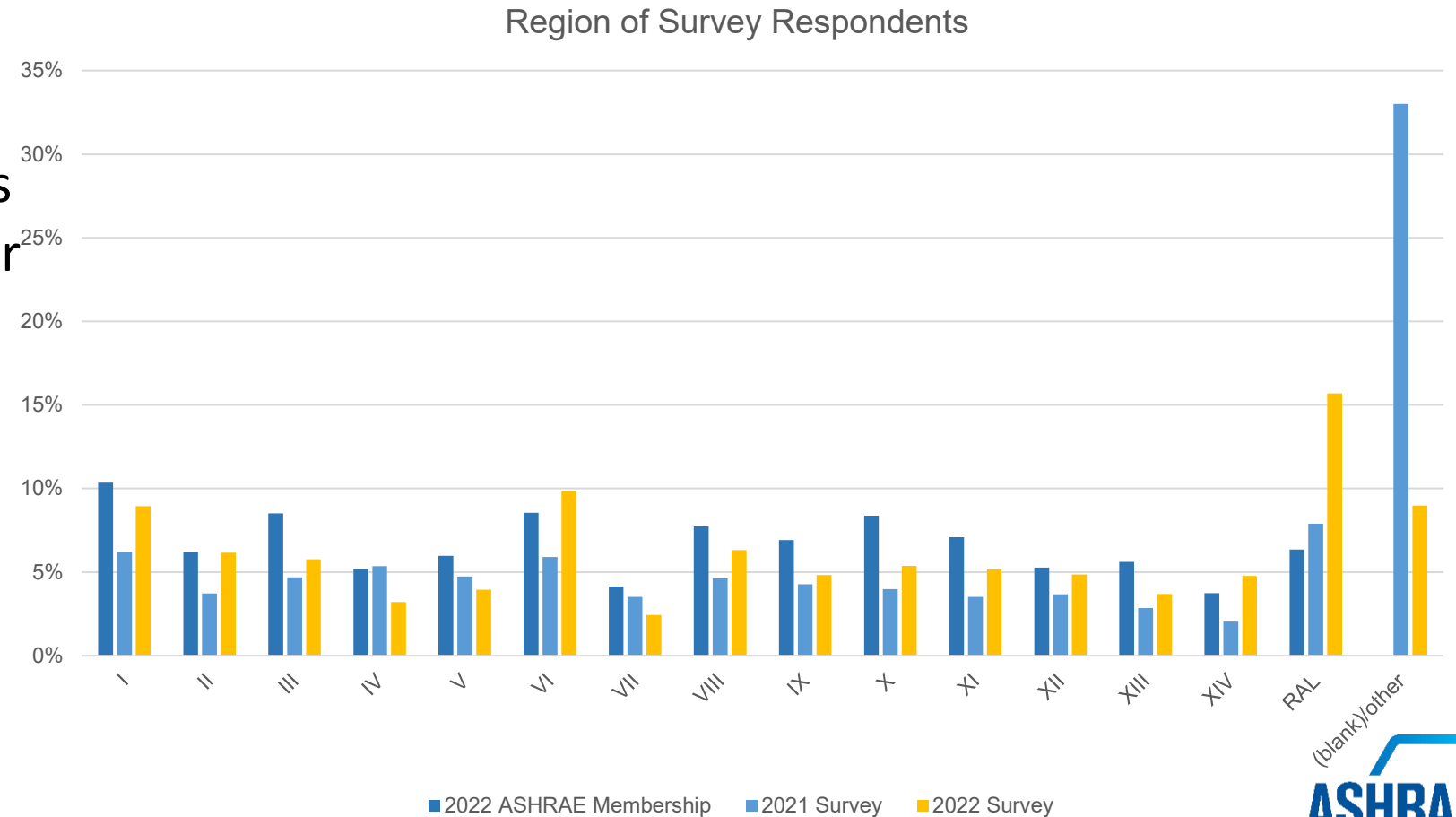
- Survey Respondents are very similar to ASHRAE membership
- Survey Respondents are very similar to last year



Region of Survey Respondents

Takeaways

- Higher response rate (less blanks) when only chapter is asked.
- RAL had a really high response rate.



ASHRAE Member Involvement

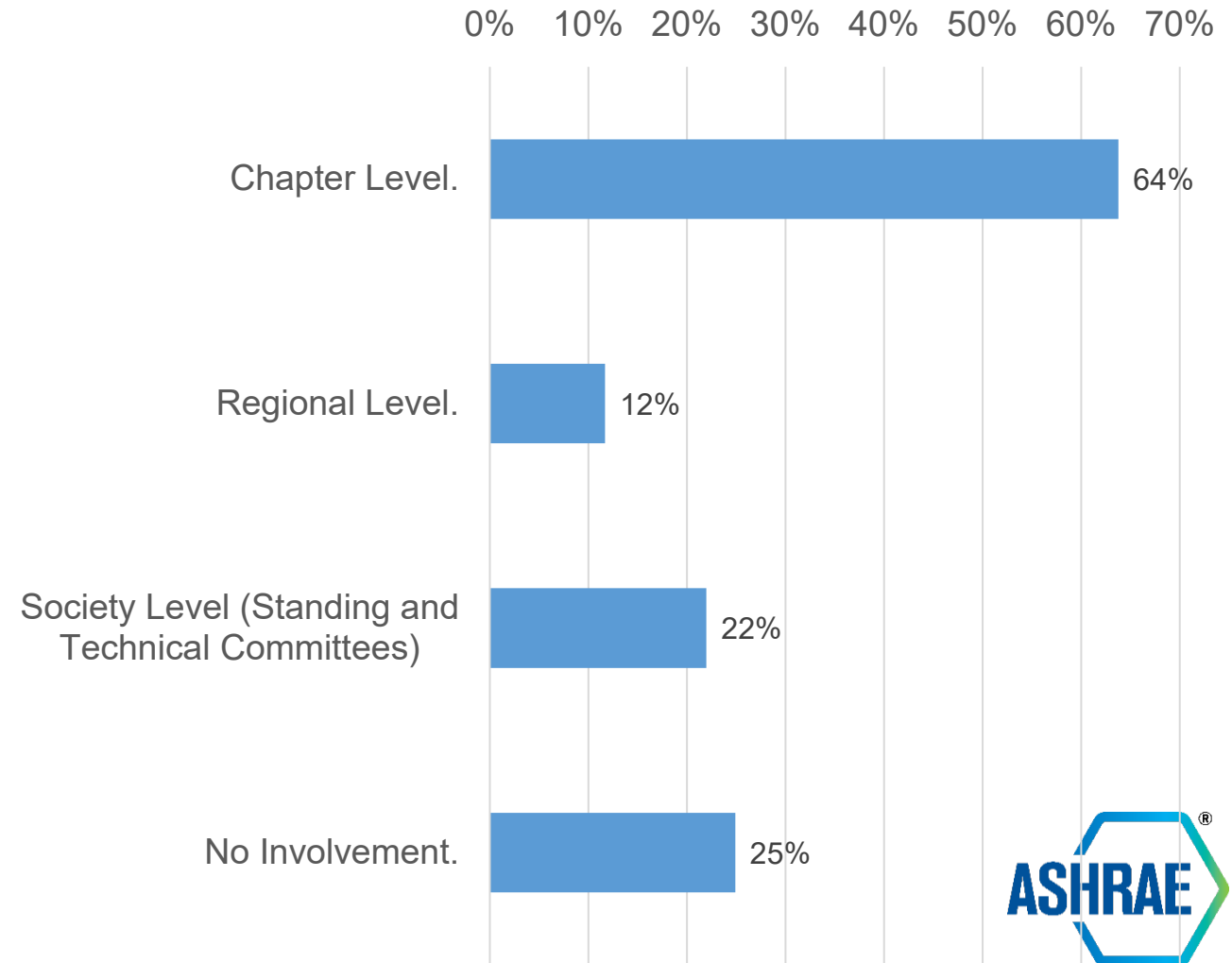
- Takeaways

- High involvement in Chapter activities
- Poor involvement at Regional level
- Promising involvement rate at Society Level

- Opportunity:

- Survey response rate needs to increase to draw conclusions

Note: Multiple responses allowed



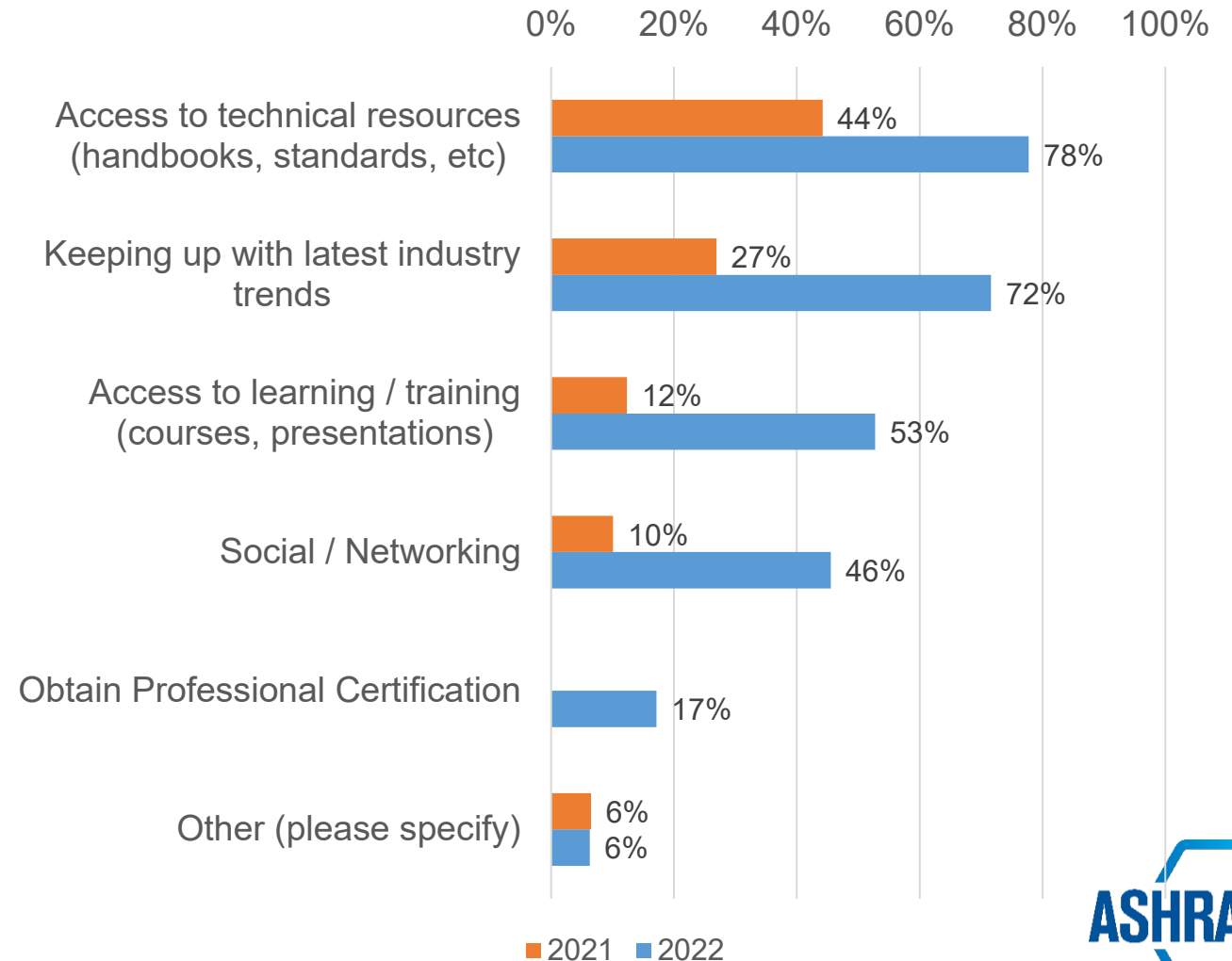


Appendix B

Individual Question Responses

What is your primary reason for being a member of ASHRAE?

- Takeaways
 - Same order of value as 2021
 - Access to technical and training resources is very valued
 - ASHRAE is a consistent source of the latest industry trends
 - Demand for social and networking opportunities has increased over 2021

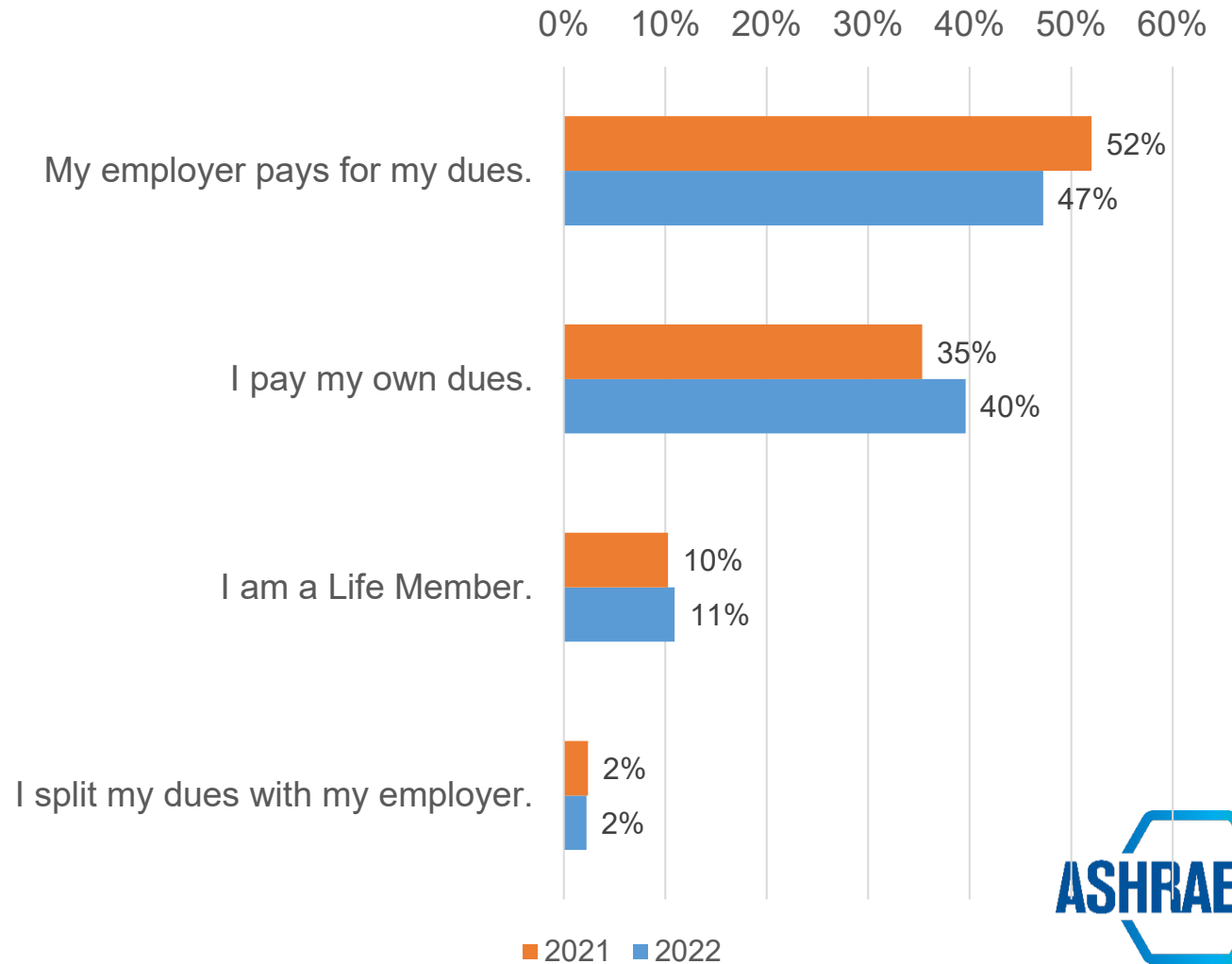


Note: Multiple responses allowed in 2022



Who covers the cost of your ASHRAE membership dues?

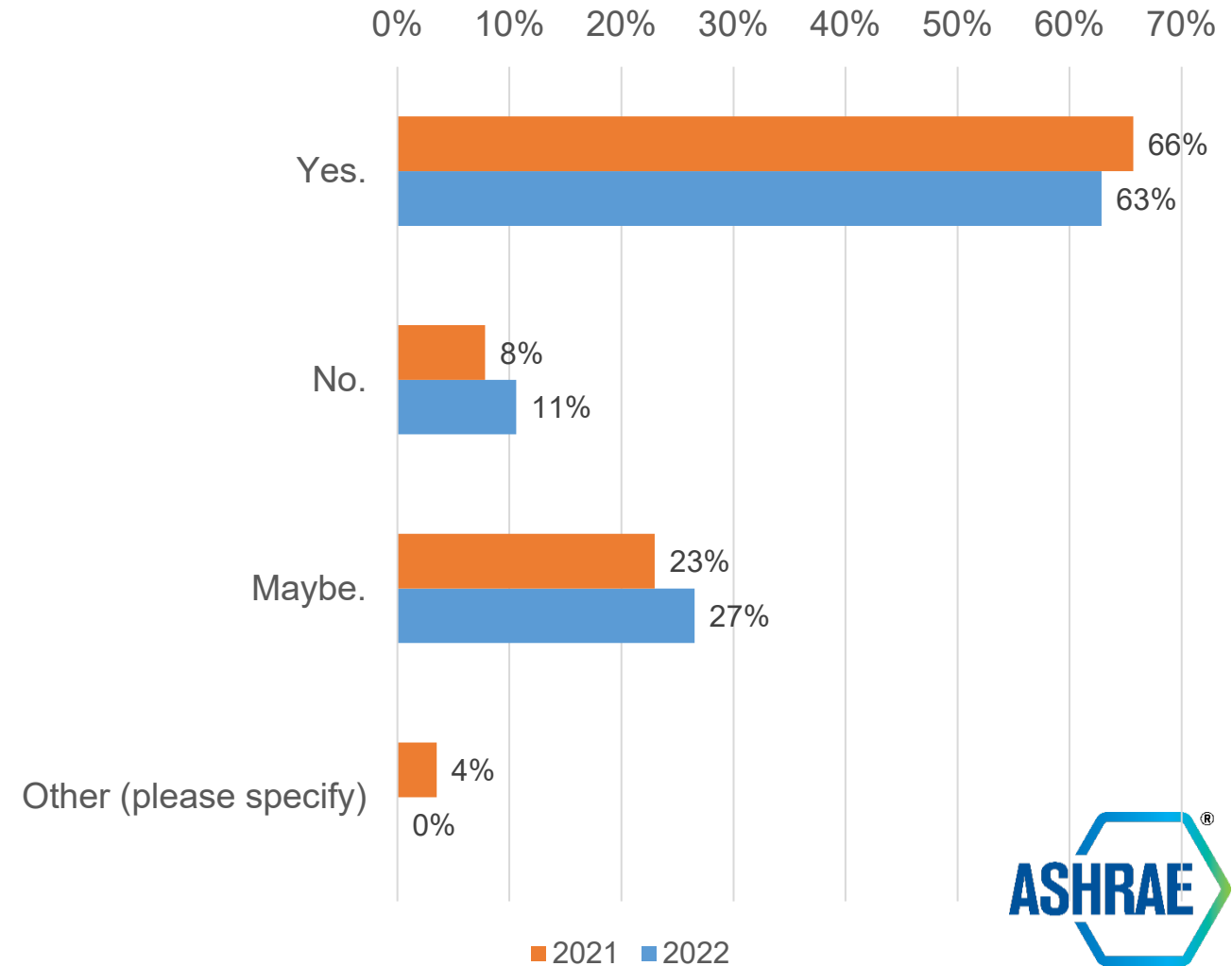
- Takeaways
 - Similar results over LY:
 - 40% of dues-paying members pay themselves
 - 47% of membership dues are paid by Employers
 - Opportunity:
 - Interact with Employers that have more than 30 members



If your company did NOT pay or help pay for your membership in ASHRAE, would you pay for membership yourself?

- Takeaways

- Confirms that ASHRAE is viewed as valuable by members. Enough to pay themselves.
- Similar to 2021, but trending downward.



What are some reasons that would cause you not to renew next year?

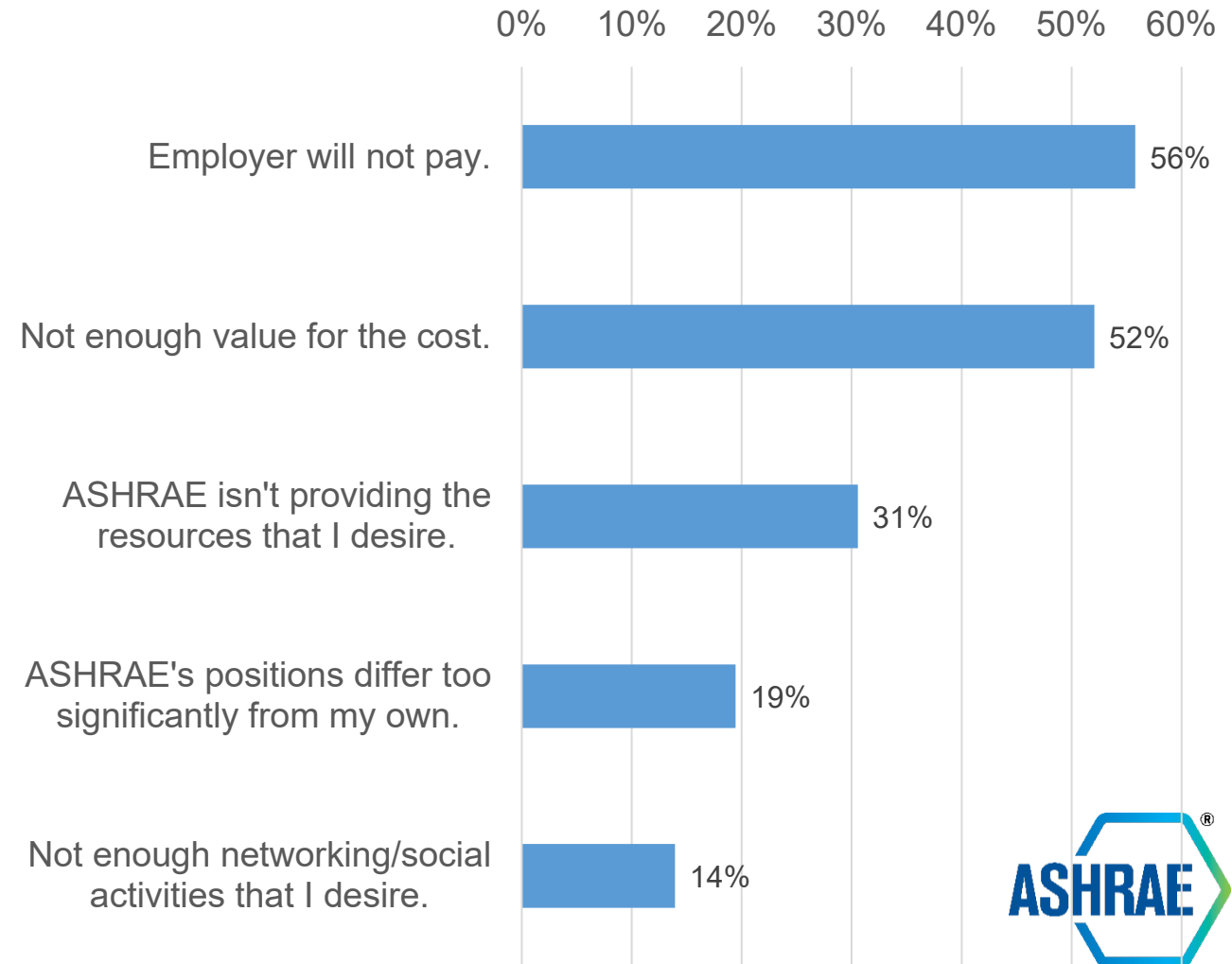
- Takeaways

- If Employer doesn't pay 50%, + members won't renew
- 50% + of members wouldn't renew if they judged ASHRAE didn't provide them with enough value

- Opportunity:

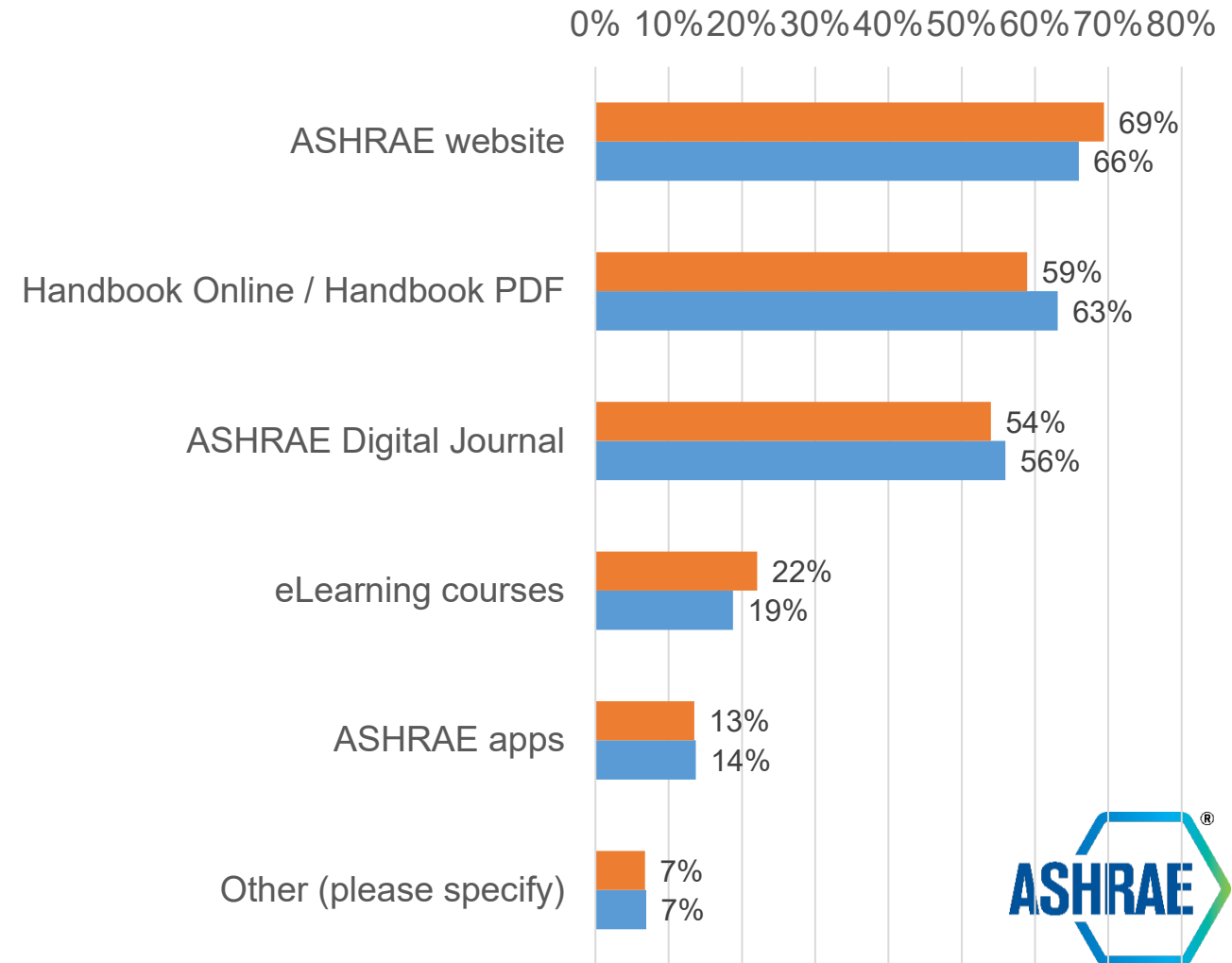
- Interact with Employers that have more than 30 members
- ASHRAE needs to stay relevant

Note: Multiple responses allowed



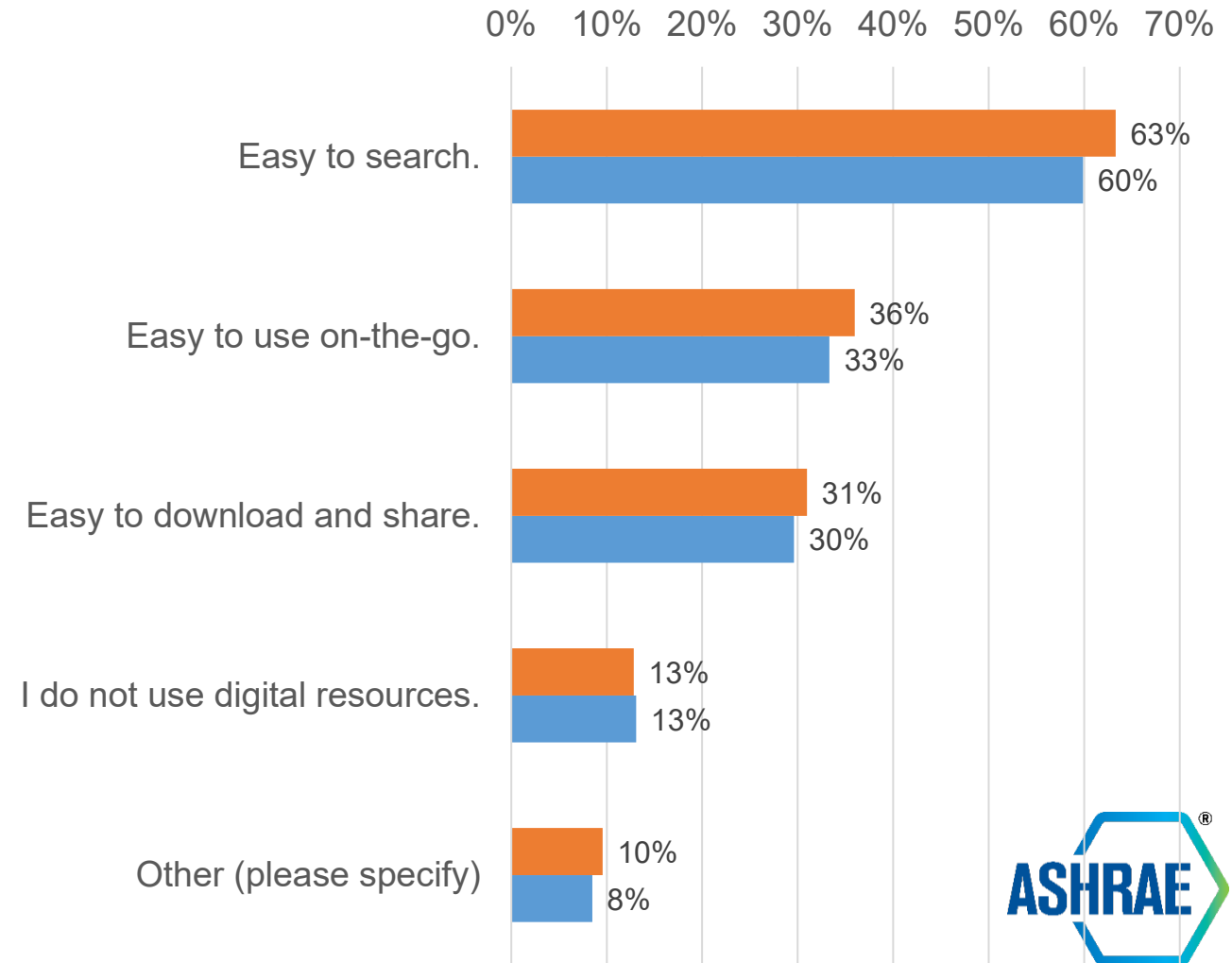
What ASHRAE digital resources are you actively using?

- Takeaways very similar to LY:
 - 90% of ASHRAE members use some digital resources
 - A strong website is important
 - Apps have little penetration
- Opportunity:
 - eLearning needs to capture more interest



Why do you use ASHRAE digital resources?

- Takeaways very similar to LY:
 - 60% value the search function
 - Likely more use the search function
 - Portability and Flexibility
 - 13% don't use digital resources



What ASHRAE service provides the most value to you?

- Takeaways
 - Publications, standards and training technical content are highly valued
 - Social, networking and research have increased over LY
- Opportunity
 - Workforce development: Professional Certifications

Note: Utilized ranked choice voting



How would you prefer to attend meetings in the future?

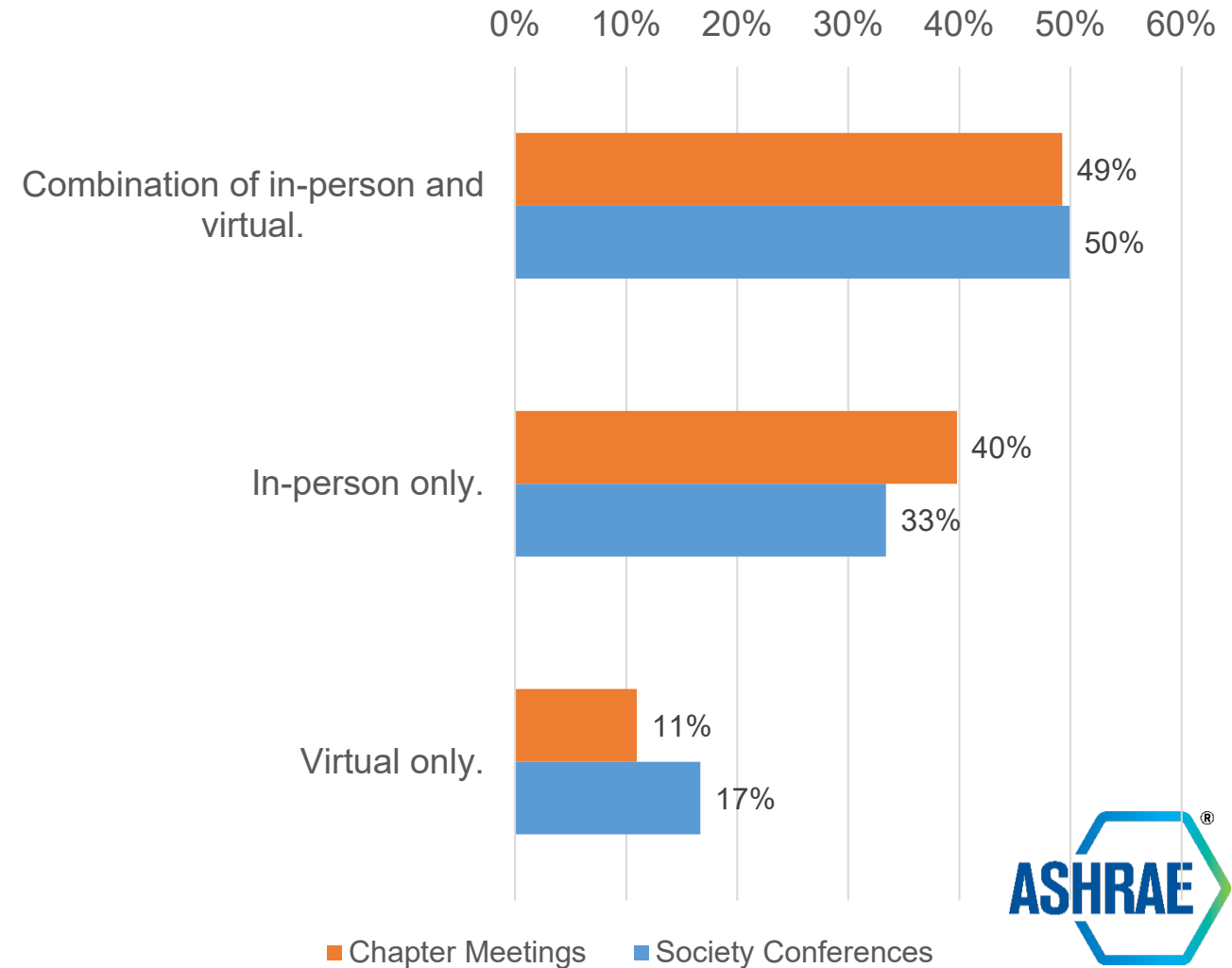
- Takeaways

- Society Conferences

- In-person attendance has doubled compared to LY
 - In-person/virtual combined attendance has 50% of support

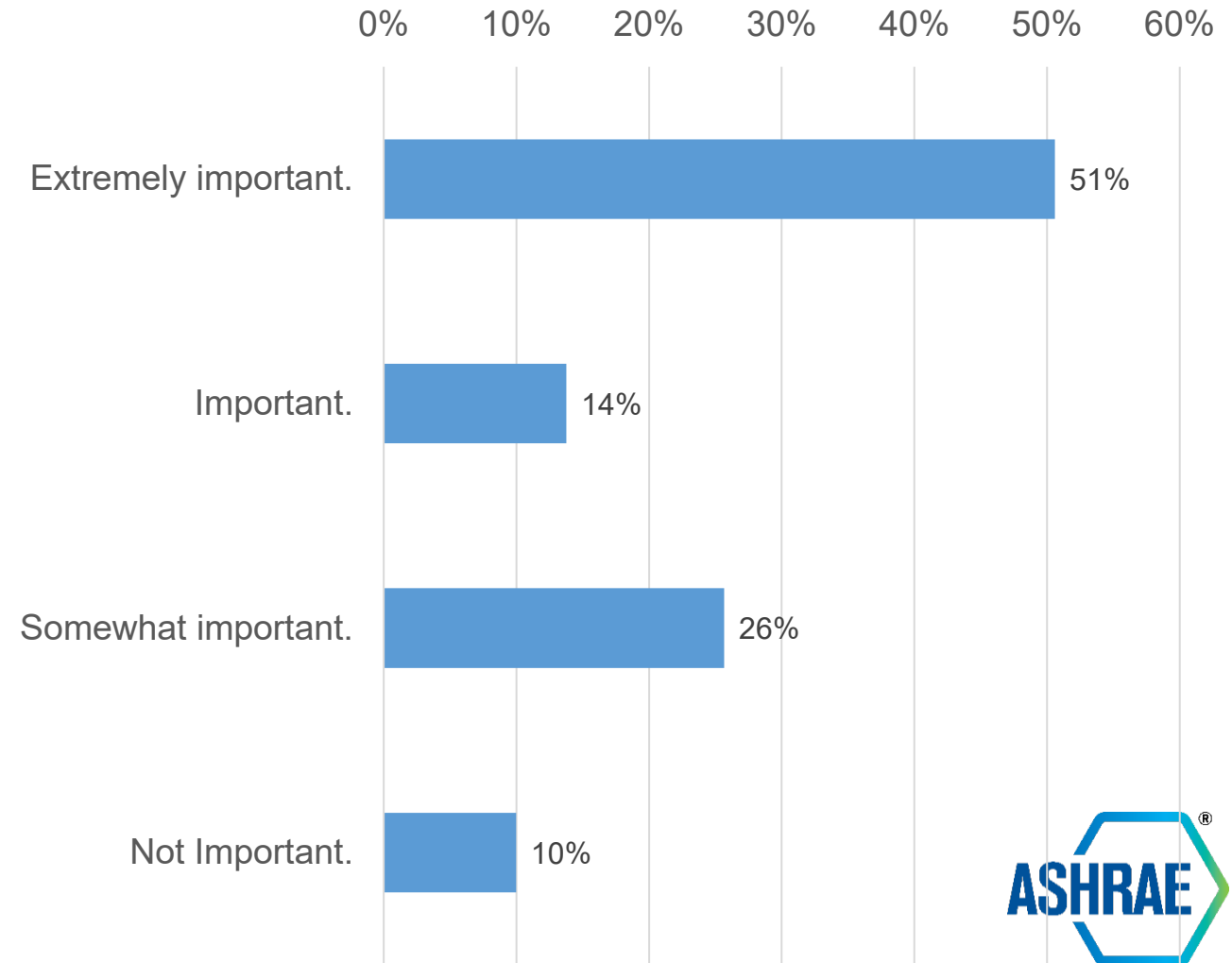
- Chapter Meetings

- In-person attendance has doubled compared to LY
 - In-person/virtual combined attendance has 50% of support



How important is it for you to be knowledgeable about decarbonization in our industry?

- Takeaways
 - 50% of members consider that their BD knowledge needs to increase
- Opportunity:
 - BD resources need to be developed with a sense of urgency



What tools related to decarbonization would be valuable to you?

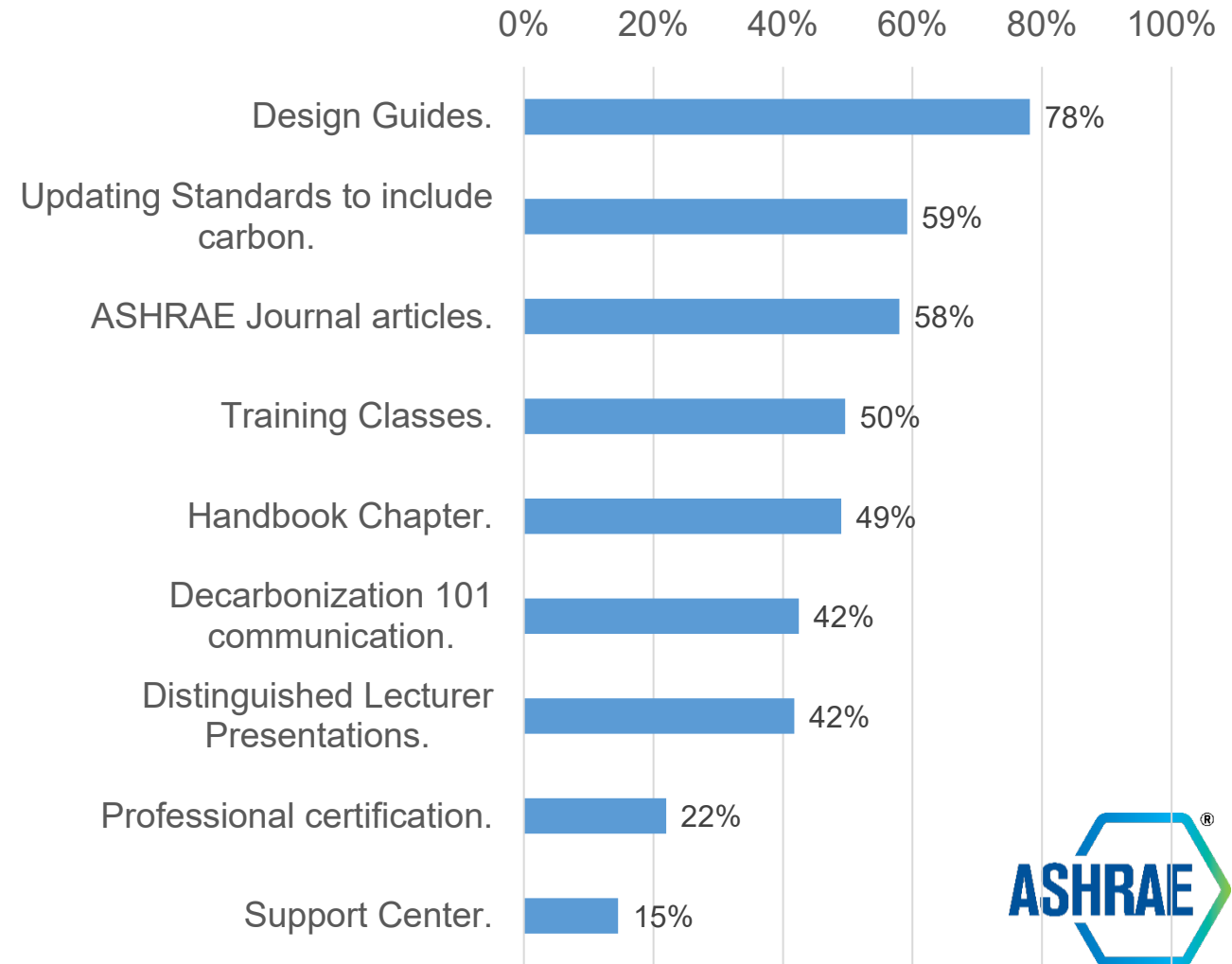
- Takeaways

- 80% of members consider that design guides need to be developed and standards need to be “decarbonized”

- Opportunity:

- BD resources need to be developed with a sense of urgency

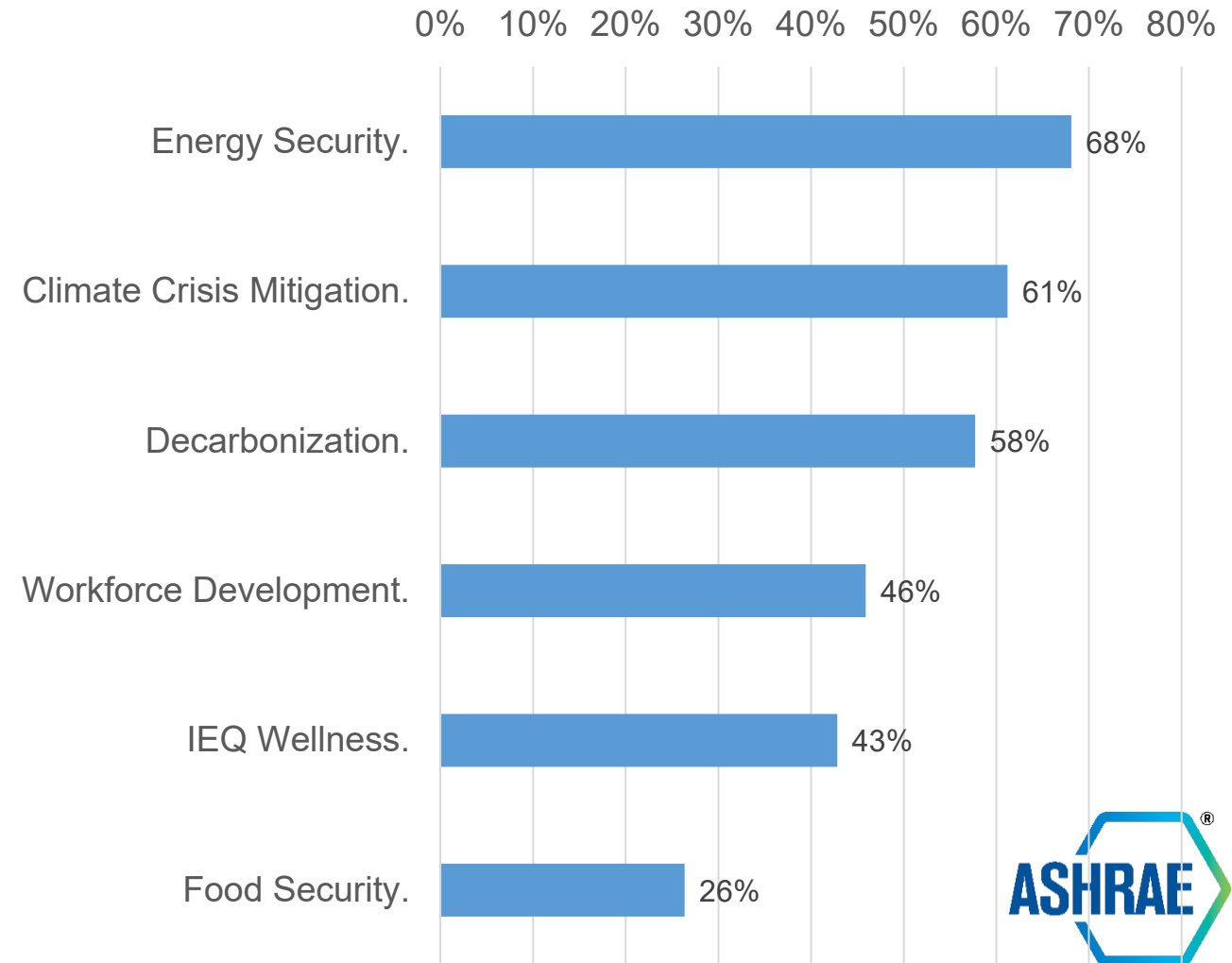
Note: Multiple responses allowed



What do you believe are the Critical Issues of our Industry?

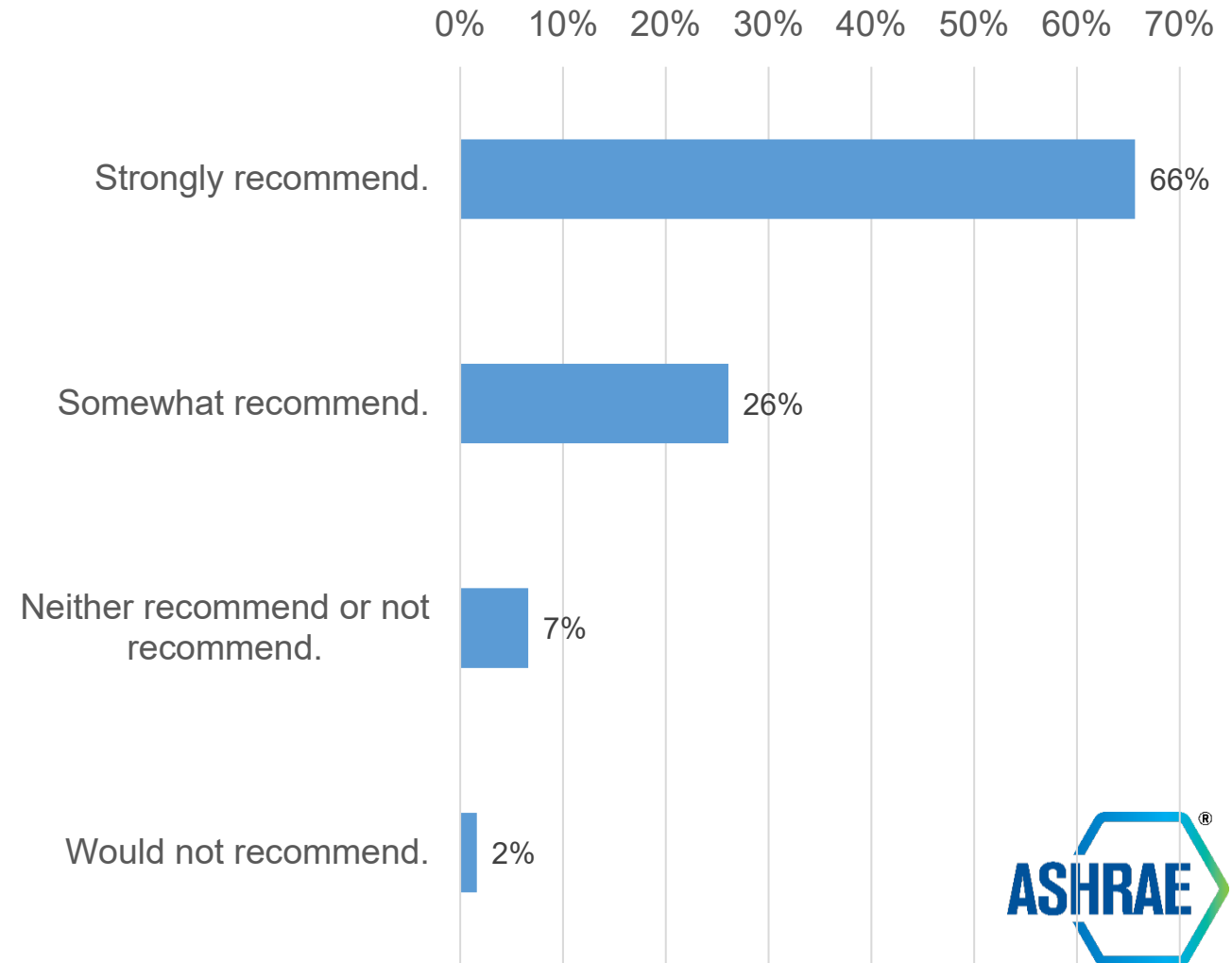
- Takeaways
 - CCM, BD and Energy Security are the main industry critical issues identified
- Opportunity:
 - Workforce Development need to be addressed as well.

Note: Multiple responses allowed



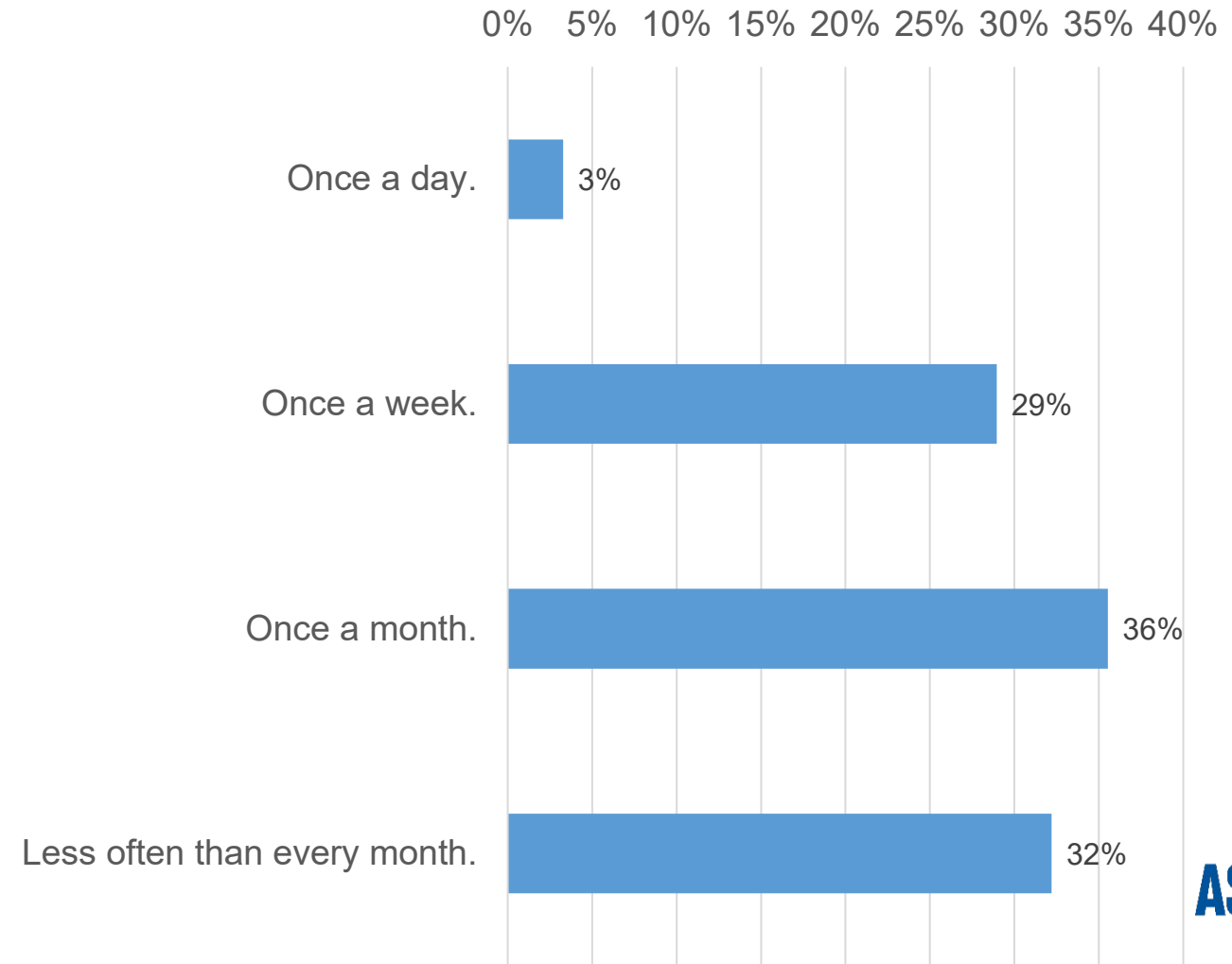
How likely are you to recommend to others in the industry to join ASHRAE?

- Takeaways
 - Members value ASHRAE
- Opportunity:
 - Do they really recommend others to join?



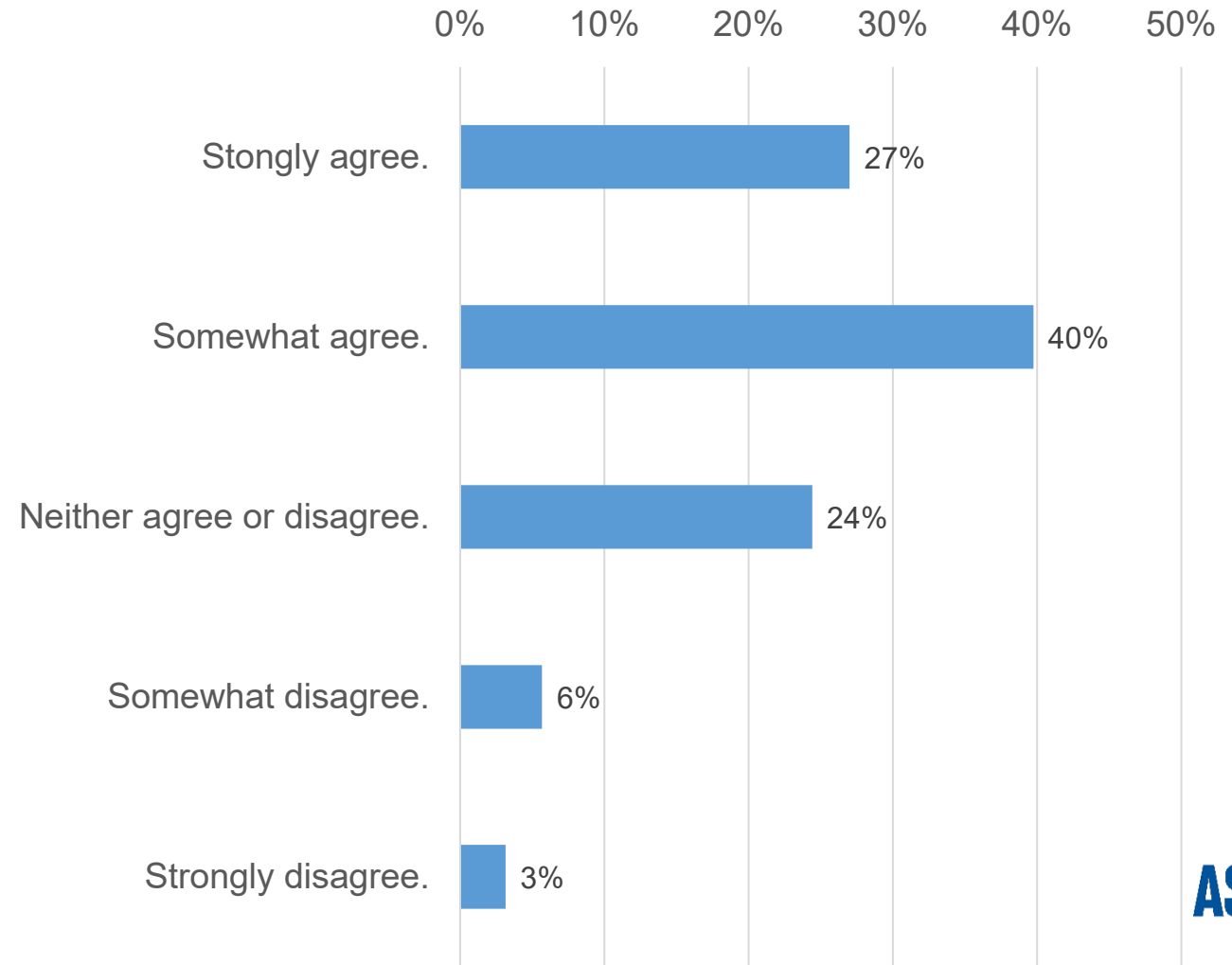
How often do you visit the ASHRAE Website?

- Takeaways
 - Low visit rate
- Opportunity:
 - Website is the main channel to promote resources; how can we address this poor rate?



Do you think that ASHRAE is assisting you with your job beyond just HVAC&R to the entire building?

- Takeaways
 - 70% of members agree





Appendix C

Summary of Additional Comment Section –
486 responses in all

Most Common Responses

- 1. ASHRAE is getting too involved in potential political issues and moving away from their core responsibilities**
 - Most comments referenced the issue of climate crisis whether ASHRAE should be spending so much of their resources on decarbonization
 - Other references to DEI, environmental justice, and food security
 - These represented 16% of the additional comments, but only represents 2.3% of total survey responses. However, these respondents were the most passionate of all responses.
- 2. ASHRAE does not provide enough value for cost of membership & activities**
 - Roughly about 10% of the respondents referenced concern over the cost of membership.
 - Several wanted to see more resources included with the membership, possibly even having a higher membership rate that included resources, made it easier for companies to justify paying for membership.
 - Additional comments about the overall cost of attending a winter or summer meeting. Registration was high, but that could be offset by shortening the meeting to allow members to save on lodging costs.
 - About 4% of the respondents specifically mentioned value was reduced by hard copies of handbooks not being included in membership.
- 3. ASHRAE is a great organization and provides great value**
 - About 10% of the respondents said they believe ASHRAE is a great organization and has been a leader in our industry. They believe they do get sufficient value for what it costs them.
 - They also provided comments that they use ASHRAE's resources all the time.



Specific comments from this section that stood out

1. Need training on how to use resources on ASHRAE website (instructional YouTube Video)
2. New members commented they would like to see a new member training/orientation webinar and/or video. If there is one, it isn't easy to find on the website.
3. One comment was from someone new to the industry, but they were over 35. They were told they could not be part of YEA, but they had found that was the best way to get introduced to ASHRAE and the areas of involvement
4. Comments included requests to see more resources beyond the design realm, i.e. commissioning and installation areas.
5. Multiple comments that ASHRAE should adopt one or two charities on Society level that chapters can support if they don't have a local charity they currently serve. "Serving mankind"
6. Need more economic data showing how HVAC impacts both domestic and global economies. Help show the significance of HVAC to others.



REPORT TO THE BOARD OF DIRECTORS
From the Building EQ Committee
As of February 5, 2023

Recommendations for Board Approval:

1. Building EQ recommends that the Board of Directors change the Building EQ Committee structure from a Board level standing committee to a Functional Group (FG) under Technology Council effective July 1, 2023.

Fiscal Impact:

As part of this change, Building EQ committee recommends that transportation reimbursement be provided for only the chair, vice-chair, and two subcommittee chairs at only the Winter and Annual conference meetings. This would reduce the current \$15k transportation budget to roughly \$5K. **Savings = \$10K per year**

The new committee structure would still require ASHRAE staff support due to the administrative requirements of the Portal which need to be handled by staff and the associated need for staff to maintain a relationship with the committee in order to fulfill the administrative requirements.

Background:

When the Building EQ Committee was originally formed, the membership was set up to require one representative from each of the Councils and three members at large. The committee reported to the Board of Directors (BOD). This structure made sense at that time, as the committee was essentially creating a new enterprise and program for the Society. The high-level reporting structure ensured that whatever policies were being enacted aligned with the Society's mission, values, and strategic plans. While the membership requirements were relaxed over time to be more skills oriented, the committee has continued to report to the BOD.

Building EQ is now an established program with a functioning on-line portal, resulting in the evolution of the committee's role in the Society. It is now a working committee that is charged with maintaining, developing, and promoting the Building EQ Portal and program. This function is much like the function of ASHRAE's standing standards project committees (SSPCs) that maintain and develop ASHRAE's most prominent standards under continuous maintenance or like a FG. The advantage of a FG is that this structure would provide greater flexibility and stability for the membership of the committee which would, in turn, improve the committee's effectiveness..

Building EQ Committee vote: 7-0-0, CV

Information Items:

1. The Green Building Institute (GBI) (<https://thegbi.org/>) has finalized Building EQ as a pathway for Green Globes Certifications.
 - The existing rating systems for new construction and existing buildings have added alternative pathways for Building EQ as an alternative to ENERGY STAR® and/or other benchmarking processes.
 - *Green Globes for New Construction 2021 (NC 21)* has adopted ASHRAE Building EQ As Designed for international projects to evaluate building energy performance based on energy modeling inputs.
 - *Green Globes for Existing Buildings 2021 (EB 21)* has adopted ASHRAE Building EQ In Operation for use by all existing commercial buildings to benchmark against the median performance of existing US buildings of similar building use, normalized by climate and occupancy.
 - These pathways require project teams to complete the Building EQ certification and provide the resulting label to their assigned third-party Green Globes Assessor for verification to achieve their respective points.
 - A regional webinar is being developed via collaboration between Region XII and GBI to highlight the adoption of Building EQ in the Green Globes Certifications. The webinar has been scheduled for Tuesday, February 28, 2023, at 12:00pm EST.

2. Committee action on the operational carbon metrics and associated electrical site source factors is as follows:
 - As previously reported the Operational Carbon metrics were launched on May 30, 2022. Three separate metrics are now available in the system including total annual operational GHG emissions, total annual operational GHG emissions per square foot, and a Building EQ Carbon Performance Score.
 - The electrical site-source factors have been upgraded for all US locations to align with the DOE eGrid subregions and for all Canada locations to align with the Canadian provinces.
 - At this meeting, the committee approved a list of 12 countries to have their site-source factors updated using data from country specific data, the Lawrence Livermore National Lab, or other sources. That work will be completed during the remainder of SY 2022-23. The countries are: Argentina, India, Colombia, Mexico, Malaysia, UK, Singapore, Turkey, Hong Kong, South Africa, Kuwait, Pakistan.
3. The Building EQ Committee reviewed and approved a nominated submission for the 2023 Energy Genius Award. This recommended recipient has been forwarded to Honors & Awards Committee for approval at their Winter Meeting. The nominee was approved 7-0-0, CNV.
4. Several updates have been approved by the Building EQ committee and will be available in the Building EQ Portal in late Spring 2023. Expenditures were approved by the committee 7-0-0, CNV.
5. John Constantinide is working to finalize the In Operation rating for the ASHRAE HQ Building. The project now has 12 months of data that includes a full year of PV solar power and is showing Building EQ Energy and Carbon Performance Scores of 6. John Constantinide is working with an Atlanta area ASHRAE member and BEAP to complete the on-site assessment and measurements so that the project can be submitted for final approval
6. The Building EQ Committee approved an RTAR to update the University Course, *Benchmarking and Assessment of Building Energy Performance*. This course was originally developed by an Ad-hoc during Tim Wentz's Presidential Year before the Building EQ Portal was launched. The proposed updates and revisions include the course information and references, Building EQ references to the Portal, and the addition of carbon metrics. The RTAR was approved 7-0-0, CNV and has been forwarded to RAC for consideration at their Spring 2023 meeting.
7. The Building EQ Committee continues to reach out to, respond to requests from, and collaborate with a number of outside organizations. Some of these efforts include:
 - The committee continues discussions with ASHE (American Society for Healthcare Engineering) about possible collaborations and the use of Building EQ in the Treasure Hunt program. Several committee members will be meeting with ASHE representatives on Monday, February 6, at 430pm EST.
 - The Committee continues to explore the market possibilities and the technical requirements for the recently completed Application Programming Interfaces (APIs) for the Portal. The committee is looking to beta test the API prior to a broad rollout in 2023.
 - The Building EQ committee approved the completed Building Certification Evaluation application form for recognition of Building EQ within [GRESB](#) (Global Real Estate Sustainability Benchmark). The application was approved by the committee 7-0-0, CNV and will now be forwarded to GRESB for consideration.
8. The Building EQ Committee has also continued to reach out to, respond to requests from, and collaborate with various existing ASHRAE committees and grassroots groups. Some of these efforts include:
 - The inaugural winners for the Student Building EQ Competition provided a poster session at this conference and were introduced and congratulated in the Building EQ Committee meeting. The poster session is Sunday, February 5, 2023, 1:30pm-3:30pm EST.
 - The committee is collaborating with YEA on a webinar to be presented on March 1, 2023, 11:00am EST. YEA has developed a flyer to publicize the event to YEA members and students.
 - The MTG for Effective Building Operation (EBO) feels that there is a great deal of synergy between their efforts and the Building EQ Committee. The MTG feels that Building EQ would be a very useful tool for MTG.EBO to support and would like to cosponsor a live demo at an upcoming conference.

- A newly created handout has been developed and will be sent to chapter representatives and ASHRAE committees who work with Building EQ. The handout could also be used with outside groups.

9. The status of the Building EQ Committee MBO's is recapped below (next page).

February 5, 2023

Michael Deru

Date

Chair

MBO #		Description	Metric	Completion status	MBO Comments
1		Identify and reach out to grassroots, technical, and professional development entities for Building EQ Resource dissemination and increased Portal usage	Presentations Chapter programs	50%	<ul style="list-style-type: none"> ▫ GBI Regional Webinar scheduled ▫ YEA Webinar scheduled ▫ Updated information sent to DLs ▫ Working with MTG.EBO on joint programs/seminars ▫ Proposed Building EQ PAOE points for SY 23-24
2		Identify opportunities to expand BEQ Portal usage.	New features added New projects New users	30%	<ul style="list-style-type: none"> ▫ RTAR to update the University course sent to RAC ▫ Carbon metrics & updated site/source factors for additional countries in progress ▫ Portal updates to align with Standard 211 Level 1 Energy audits and improve Portal usage underway
3		Develop a plan to increase usability and scalability of Portal program applications through the use of the API	New partnerships API requests	20%	<ul style="list-style-type: none"> ▫ Finalizing Version 1 rules and technical requirements for use of API ▫ Identifying beta testers for API ▫ Working to identify market possibilities and partners for API use
4		Generate and develop shared program opportunities with outside agencies / associations	Partnership Opportunities	30%	<ul style="list-style-type: none"> ▫ Continuing conversations with IMT, ASHE, and IBPSA ▫ Collaborating with GBI on webinar and joint marketing strategy for Green Globes and Building EQ

Motion

An annual half-day virtual retreat of ASHRAE Board be called with the members of the Planning Committee to review ASHRAE Strategic plan and its implementation.

Background

Per the Rules of the Board, the ASHRAE Board is to be involved in the strategic plan and evaluation of Society's short-term and long-term vision. ASHRAE Strategic Plan is the guiding document that defines Society's long term vision. Although ASHRAE Board members are actively involved during the development of the ASHRAE strategic plan, in order to accomplish ASHRAE's mission and vision it is necessary for the ASHRAE Board members to be continuously engaged into the revision and implementation of the ASHRAE Strategic Plan. Currently the major responsibility of the Strategic plan revision and implementation is primarily left to the Planning committee. By virtue of the Rules of the Board stated below, the proposed half day retreat with the member of the Planning committee will serve the purpose and actively engage ASHRAE Board members into strategic activities of the Society. Since the proposed retreat will be conducted virtually there is not a direct fiscal impact of this activity.

2.200.009 BOARD GOVERNANCE

(08-06-22-04)

2.200.009.1 The Board of Directors adopts the following resolution committing itself to assuming a high-impact governing role:

2.200.009.2 Whereas, ASHRAE's long-term effectiveness and growth in a changing, challenging environment depend on the high-impact leadership of a **Board that continuously answers three critical questions in a full and timely fashion: Where should ASHRAE be headed, and what should it become, over the long run? What should ASHRAE be now and in the near-term?** And how is ASHRAE performing as a nonprofit corporation, both financially and programmatically?

2.200.009.3 Whereas, the ASHRAE Board needs to transition itself from a body immersed in technical and operational detail to a body that focuses on governance and high-level strategic decisions.

Fiscal Impact

None

Informational Item

This motion was discussed with the Chair of Planning Committee and the Chair of Planning Subcommittee for Strategic Plan. They were in support of the motion.

**REPORT TO THE BOARD OF DIRECTORS
From ASHRAE Global HVAC&R Summit
January 19, 2023**

Recommendations for ASHRAE Executive Committee:

1.	MOTION:	None
	BACKGROUND:	N/A
	FISCAL IMPACT	N/A

Information Items:

1. The ASHRAE Global HVAC&R Summit was held Oct. 10 and 11 in Istanbul, Turkey. The Summit was held in conjunction with the Region-at-Large CRC, which followed the Summit, and ASHRAE's second international Board of Directors meeting.
2. This was a unique, first-time effort by ASHRAE to conduct an international Summit on a "by invitation only" basis. The "by invitation only" format was used to ensure:
 - a. All segments of our industry were represented to provide diversity of thought
 - b. Highly placed, strategic thinkers with topical expertise would be in the room
 - c. Best use of the two-days allocated to the Summit to tackle the six 'Critical Issues of the Day'
 - d. Adherence to the limited budget available
3. Six 'Critical Issues of the day' were selected to be addressed by the Summit based upon an international survey conducted by ASHRAE's AASA. Remarkably, six critical issues were easily and clearly identified by the survey, thus making our job easier.
4. The entire ASHRAE Board of Directors were included as delegates to the Summit. Our target was to have a total of 60 invited delegates, which included the BOD. The final count of delegates was 72 due to the high demand for invitations. Our target for additional attendees was also 60, to be comprised of interested parties from RAL. The final count of attendees was 70, again due to high demand. We had to order extra chairs brought into the main hall to accommodate all of the attendees and delegates.
5. The delegates were assigned to one of the six topical breakout teams, based upon their preferences. Each breakout team was led by a trained moderator and included a recorder selected from ASHRAE Staff Directors. The keynote speaker for each of the six topics was allowed to sit in the breakout rooms as a resource.
6. The final expenditure for the Summit was \$22,601. A spreadsheet on the final budget is attached to this report.
7. The final report was written by the Summit Leadership team of Bjarne Olesen, Hugh Crowther, and Tim Wentz. The moderators and recorders then edited the reports. The final editing was done by Cindy Michaels, who should be recognized for an outstanding job under a very tight timeline. A copy of the Summit final report is available for download at <https://file.ac/la7qMsAms7o/>. The final report is also available on ASHRAE's webpage on the ASHRAE President's page, on the free resources page and on the AASA website. A distribution plan for the final report has been developed by Vanita Gupta and Mark Owen and includes the following:

- Jan. 12 Social Media post on President's Facebook page
- Jan. 16 (week of): Email to AASA, Attendees of Summit, BOD, Staff Directors
- Jan. 19: HVACR Industry (Distribution: 100k members included)
- Jan. 20: Include in Board Activities email
- Jan. 26: Include in Chapter Notes (Distribution: Chapter & Region Volunteer leaders)
- Jan. TBD: Insights (Distribution: 94k members included)
- Feb. TBD Podcast during AHR Expo (Journal team will coordinate)
- Mar. ASHRAE Journal (Distribution 60k members included)

8. Special thanks go to the following members of the Summit Coordination Committee and support staff:

- Adeeba Mehboob, RAL Liaison – Committee member
- Franco D'Atri, AASA Liaison – Committee member
- Tony Giometti, ASHRAE Staff – Committee member
- Cindy Michaels, ASHRAE Staff and final report editor
- Hugh Crowther, Summit Co-coordinator
- Bjarne Olesen, Summit Co-coordinator
- Tim Wentz, Summit Co-coordinator

1/19/23
Date


Chair



2022-23 Industry Roundtable Notes

3 February 2023

As part of Society President Farooq Mehboob's "Voice of the Customer" initiative, Industry Roundtables have been held at several CRCs and ASHRAE's 2023 Winter Conference. (Appendix A provides a model agenda, objectives, outline, and checklist for these meetings.) Following a list of common themes, the remainder of this document is a compilation of notes from each of the Roundtables.

Common Themes

- Need for localized technical materials, some in-language, at affordable prices
- Need for localized education, training, and professional development across industry segments
- Desire for harmonization of international technical guidance and standards
- Need to connect building design with operation in real-life and in real time, both in the current state of the industry and in the future, which will be more technology-driven
- Desire for processes that allow technical materials to keep up with technology
- Concern that ASHRAE technical guidance results in oversizing equipment
- Need for harmonized advocacy to help governments set requirements and criteria

Region XIII, Tokyo (excerpt from Report from DRC Leong)

1. **ASHRAE Membership in Japan**

- 1.1 All 10 local representatives know ASHRAE but only 2 are ASHRAE members
- 1.2 All said that local SHASE (The Society of Heating, Air-Conditioning and Sanitary Engineers of Japan) in Japan is predominant and recognised by their local Government
- 1.3 All Japan Chapter members (80% are lecturers in University) joined ASHRAE as they find the technical information is relevant to their work or unable to find what they need in their local SHASE eg ASHRAE Standards
- 1.4 One mentioned that he joined ASHRAE as he finds the people in ASHRAE friendly and easy to communicate with for his research on VAV design

2. **Why do the local representatives find ASHRAE relevant and useful?**

- 2.1 Nearly all said that ASHRAE Standards, Handbooks and technical information are most relevant and useful
- 2.2 Most overseas and international investors recognise ASHRAE Standards
- 2.3 One mentioned ASHRAE research paper is useful

3. **Training, Certification and Research**

- 3.1 The local representatives said that trainings and certifications are not relevant for them as their local Government only recognise their own local trainings and certifications
- 3.2 For overseas projects, most find ASHRAE standards and LEED certification useful

4. **What do the local representatives want ASHRAE to do?**

- 4.1 Take leadership in refrigerant trend and harmonization
- 4.2 More technical and YEA exchanges
- 4.3 More weather data for building design
- 4.4 More information on EPD, Carbon neutral and other Decarbonization related calculations
- 4.5 ASHRAE to take leadership of BACNET and ensure interchangeability of BAS controllers and field devices
- 4.6 3-D BIM modelling with energy consumption & predictive analysis, efficiency, etc.

4.7 Provide advanced energy design guides including case studies

5. Manpower issues

5.1 All the local representatives lamented that there is a labour shortage

5.2 There is about a 5% decrease in labour supply every year

Region XIV, Madrid (excerpt from notes from EVP Jeff Littleton)

Areas of concern and initiatives moving forward

- Data Centers, including energy standards for these facilities
 - ASHRAE needs to provide very good documentation
 - Keep in mind the variety of users, because some companies, such as large phone companies, don't have standards related to HVAC
 - Some companies are still working with older assumptions about data center temperatures, which might create energy inefficiencies
 - New association of datacom center companies has just been formed
- Localized technical information and materials
 - Atecyr, which is an AASA member, sees ASHRAE as a competitor
 - ASHRAE should promote relevant standards to European countries and to companies; European countries tend to share information and “standard operating procedures,” so establishing ASHRAE throughout the continent will be important
 - ASHRAE is not well established in some countries, such as Spain; some companies don't trust ASHRAE standards; some countries still focus on the “A” in ASHRAE
 - Language is an issue -- not all people in the building industry speak English
 - Some countries have their own standards and building codes
- Refrigerants
 - Need for continued staff training
 - F-Gas regulation
 - Natural refrigerants: HFO, CO₂, ammonia; issues of energy efficiency, safety, environmental impact, cost
 - Need for harmonization of standards, codes, industry “standards,” and equipment across countries and climate zones: ASHRAE can help provide data and materials
- Heating/Cooling
 - Thermal comfort vs. energy efficiency
 - Health and safety concerns, e.g., legionella, respiratory viruses
- Energy efficiency
 - Need to define criteria to replace equipment that is below a certain efficiency threshold
 - Price is the key driver, but benefit for the investor and for society should be just as important
 - ASHRAE can provide data and materials to help establish “industry standards”
- Procurement Manager
 - Need for qualifications
 - Need for workforce training
 - Need to “right size” equipment – some guidance results in oversizing; no one wants to undersize
- Perception of the HVAC&R industry
 - Students want to be business consultants instead of going into engineering
 - Building industry appears to be the problem in regard to global warming
 - Engineers move to countries that have secure job opportunities

Region-at-Large, Istanbul (excerpt from notes from EVP Jeff Littleton)

Issues that need to be addressed

- Supply Chain
- Human resources
 - Need a definition of mechanical engineering
 - Need to develop criteria for being an engineer
 - Need education to teach engineers what they need to know in order to practice

- Lack of licensing requirements/professional association in some countries; ASHRAE's certification programs might be an alternative in some places
 - Advocacy to an appropriate ministry might help get ASHRAE certifications accepted/ approved/encouraged
 - Consider localization of certification programs
- ASHRAE could help educate people, possibly in conjunction with local professional organizations
- Language is a barrier, but printed materials can be in English
- ASHRAE can provide Train the Trainer opportunities
- Standards
 - ASHRAE Standards commonly used for cooling, but ISO and CEN standards are used for heating
 - May need to be localized
 - Use of different standards/Lack of uniformity of standards
 - Standards need to be updated to reflect new generation of products and services
 - Possible need to transition from prescriptive to performance-based standards
 - Need to be open for innovation, more flexible
 - Translation of standards might help with adoption
- Accounts Receivable
 - HVAC&R is a business
 - Want to be environmentally conscious, but have to pay the bills and need customers to pay their invoices
- Technology developments and research
 - Need for systematic approach
 - Need 3rd party research, not only from manufacturers
 - Researchers need to talk with architects, engineers, operators, etc.
- Lack of electrified systems in buildings
 - Can the building operator actually run the building?
 - Heat pumps or hydronic systems?
 - Utility prices are too low in the U.S. to drive people to be more energy efficient
 - Europe has an energy label that is driving customers
 - Building codes are driving towards higher efficiency
- BIM
 - Should be required
 - Local manufacturers don't include their equipment in BIM
 - Need affordable tools to drive BIM
 - Liability concerns
 - ASHRAE Standard 224 nearing completion; being developed jointly with NIBS
- Economics: In price sensitive markets, price/low first cost takes priority over quality design.
- Contractor/Designer Cooperation
 - ASHRAE workshops might help
 - Commissioning or Testing & Balancing might be good topics to encourage cooperation

2023 ASHRAE Winter Conference (excerpt from notes from Joyce Abrams)

- What is the most critical condition that is currently impacting our industry and how can ASHRAE help?

Buildings (higher education and healthcare in particular) are different ages. Difficult to cross-reference which Standard in any given building and for any given equipment/system is applicable.

ASHRAE does a good job of reaching out to core membership. Opportunity for outreach to owners, developers, other high-level influencers.

Need to emphasize health and safety in existing buildings, not new buildings. Need to figure out guidelines for controls and sequences for existing buildings, especially for energy efficiency and

reopening schools and other facilities that were hit hard by the pandemic.

Have to balance moving forward with the software side of building operations and performance while keeping the network secure.

Industry is evolving. Buildings and owners need to evolve with the industry.

Need more integration between designers and operators.

Young engineers need to be able to problem-solve onsite. Consulting engineers need to bring together “book learning” and “field sense.”

In future, engineers will do less designing and more problem-solving and real-world work on buildings. Some firms use virtual reality to plan getting chillers on roofs in metropolitan area, for example.

Need to look at business side: expected to do more with less, faster. HVAC&R isn't seen as a “sexy” option for young engineers. Have to make the business case for energy efficiency and better buildings.

Also, need to look at capability of operators and facility managers because buildings can be overbuilt for their abilities.

Need O&M manual standard. Standard spec by equipment type (e.g., for chiller, air handler). O&M manuals typically come from manufacturers – would they like guidance on what should be in the manual on how that piece of equipment fits into a system?

- What is the role of artificial intelligence for ASHRAE and the industry? Should ASHRAE look at strategic application of AI?

ASHRAE could provide connection between technology and real-life.

Get ASHRAE's technical knowledge and data into AI software

Many consulting engineers and firms are investing in automating tasks that had been more manual. Can ASHRAE help with this transition?

Can ASHRAE help small design firms integrate technology into their work processes?

If technology/software generates designs that owners can't operate, that's not helpful. How do we get the owners to understand and approve what the industry wants to do?

ASHRAE can lead the way in the evolution of the design/consulting engineer's job.

Need more integration across industry segments to determine the building industry's future. Need diversity of thoughts, insight, and input.

Appendix A. Model Agenda, Objectives, Outline and Checklist

Agenda

14:00 to 14:15 (Note: Use whatever time you plan on using to start the round table)

- Welcome and opening remarks
- Introduction of ASHRAE officers and special guests
- Introduction of round table moderator

14:15 to 14:30

- Round table discussion
 - You might want to have a whiteboard or other space to write upon so that you could ask the crowd what topics they would like to hear discussed at the round table. This might be a great way to start the round table.
 - If you cover all of the audience's questions you can start in on the questions you have developed below.

15:30 to 16:00

- Wrap-up to include any themes or common threads discovered during the round table.
- The proceedings will be typed up and shared with all who attended.

Objectives

- Provide a platform for local manufacturers, services providers and AASA members, etc. to discuss issues of the day and what the HVAC industry needs
- This is also part of the current society theme "Securing Our Future" to focus on harvesting information from industry so that our chapters, Regions, and Society can better serve our membership and industry as a whole
 - One such initiative envisions conducting 'Voice of the Customer' round tables at select ASHRAE meetings, including some CRCs

Outline and Checklist

1. Have you heard of ASHRAE? Do you know what ASHRAE stands for?
2. Do you know ASHRAE mission statements?
3. Are you an ASHRAE member?
4. If yes, why and what attracts you to join ASHRAE?
5. Does ASHRAE plays a part in your work and what you do?
6. How does ASHRAE's deliverables (Standards, Position Papers, etc.) affect you and your work or in any way?
7. How important do you place ASHRAE in your work and in what you do?
8. What do you think is lacking and need to be addressed?
9. What and how do you like or think ASHRAE should focus on?
10. Please provide your ideas, suggestions, and comments for ASHRAE to improve.

Appendix B. Raw Notes from Region XIII Roundtable (Tokyo)

Notes supplied by DRC

List of predetermined questions with comments

1. **Have you heard of ASHRAE? Do you know what ASHRAE stands for?** Everybody knows, so we skip this one.
2. **Do you know ASHRAE's mission statements?** (explained)
3. **Are you an ASHRAE member?** (show of hands—all but a few are)
4. **If yes, why and what attracts you to join ASHRAE?**

Because a colleague at Daikin invited.

Please raise your voice to EU re: refrigerants and regulations

Thermal comfort is my interest, and Standard 55 provides up-to-date information. Most of our colleagues are members of SHASE, which dominates research and policy, so need to collaborate. Language is one reason. Also, local Japanese law/codes are dominant, and information needs to take into account.

How can SHASE and ASHRAE work together? We are committed to that. In AASA, we try to find common interests and work together on them. We can create a work plan between ASHRAE and SHASE.

Biggest reason is worldwide communication, network of chapters. Latest info from ASHRAE Journal.

Informs design work and is necessary for international design work.

ASHRAE has many more members and provides much more information

Entry to ASHRAE technology info. ASHRAE Journal. Covid info response. Helps our business.

Refrigerants. Std 34. Japan has another standard.

Wanted to do more before I retire (?)

Needed more information than from service manuals. Professor told me ASHRAE has the information you need. So for 34 years, have been involved with ASHRAE. Makes you more income than your membership dues.

ASHRAE is the only society that provides so much information, and networking is valuable for not only business but friendships.

5. **Does ASHRAE play a part in your work and what you do?**

Design firm and contractors do work based on ASHRAE standards. But some standards can be too conservative based on academic basis (?).

Is language of ASHRAE a problem?

No, but too conservative.

Important part of globalization for us. International clients investing in Japan prefer ASHRAE standards. We have to merge both SHASE and ASHRAE standards.

(Anecdote re: JIS v ASHRAE standard, which had same requirement. Pointed out benefit of harmonization.)

Helps us do business in many countries other than Japan.

We use ASHRAE Handbook; sometimes we translate into local language for use.

ASHRAE papers and ASHRAE Handbook.

LEED requirements based on ASHRAE standards.

ASHRAE Handbook, Journal, Standards information most critical thing for us.

What about ASHRAE training, research, other products and services besides those mentioned above?

Seminars, design guides, webinars, papers, research reports.

What about Certifications? Are you aware of this?

Not here.

Have Japanese certifications for construction professionals to have government registration purposes.

ASHRAE Certification is not required for registration but for customers/business.

Would be relevant if international customer required.

I have BEMP.

Useful for other regions if we localize the information.

More international owners are requiring.

6. **How do ASHRAE's deliverables affect you or your work in any way?** (see previous answers)

7. How important do you place ASHRAE in your work? (see previous answers)

8. What do you think is lacking and needs to be addressed?

Some information require over-design...generally too conservative across the board.

Load analysis too conservative?

Yes.

BIM and construction automation. Information is still rudimentary in BIM models. Need more detailed data in objects. Standardized objects data needed.

Future direction of refrigerant. R-32. Lower-GWP refrigerants. Need ASHRAE leadership in harmonizing global refrigerant regulations.

We use ASHRAE standards often; very useful for work. Would like to see a YEA exchange.

BACnet not so open system recently. Want to make BACnet like Internet. Decarbonization is important issue, operation and embodied. Very interested in output/guidance on that topic.

Case studies, AEDGs. Decarbonization. Weather data for designs to account for future.

Weather data that takes into account future scenarios. Maybe have data for 2030, 2040, 2050, etc. based on various probabilities.

9. Please provide your ideas, suggestions, and comments for ASHRAE to improve.

(see above)

Additional questions/comments

Please expand on legal, government requirements in Japan for energy, carbon use?

Energy, yes, but for carbon, not much information yet.

At Daikin, need harmonization for our planning and work.

Right now, focus is on concrete and steel, but we will soon need to provide information on HVAC system info.

ASHRAE working on appendix to 90.1 on carbon. Also see Building EQ for carbon calculation.

At Daikin, target for zero carbon by 2050. ESG analysis required of mfrs, but no clear guidance. Needed.

Workforce issues? What's needed?

Yes, is key problem in Japan. Labor force decreasing by about 5% per year. Can import some labor but difficulties there. Few welders, e.g. So maybe less onsite labor of that type and more prefabricated construction elements in factory.

Technicians, too?

Yes, is major issue. Many are overworking. Law to reduce hours to 45 hours per week. Compensating by using offsite construction to save onsite workload.

Questions for us or comments for the group?

Do you have hourly/yearly data for energy consumption on actual buildings?

CBECS data from US DOE (MO: and in Handbook). 5.9M USA buildings.

Summary of what we've heard today.

1. Concern on different directions on refrigerants. ASHRAE needs to lead on this subject.
2. We need to strengthen our collaboration with SHASE.
3. ASHRAE Handbook is primary text, and it may be helpful to have in other languages.
4. ASHRAE Certifications
5. ASHRAE Fundamentals, Standards lead to overdesign
6. Future weather data important
7. Automated construction coming; need standards for object data in BIM.
8. Young engineers would benefit from exchange.
9. Decarbonization design standards and calculation methods are needed.
10. BACnet is supposed to be open system, but in reality is open at the device level only but not at the control level, so need work to help that.

Appendix C. Excerpted Raw Notes from Region XIV Roundtable (Madrid)

- Introductions
- Roundtable -- deepen our relationship between ASHRAE and
 - Had one in Tokyo two weeks about
 - Might have one in Istanbul
 - Monterrey
 - Istanbul
 - We want to understand the needs of industry and how ASHRAE can support that effort.
- We are here to listen
- We would like to hear from you -- areas of concern and initiatives moving forward.
 - Data Centers --
 - **Energy Standards for data centers**
 - ASHRAE needs to elaborate very good documentation.
 - Understand many different companies. Work with Telefonica which is a large phone company. They don't have standards related to HVAC. They are based on older assumption. They want their IT rooms to be 19-25 degrees. Working Microsoft, Google. And they are using ASHRAE standards. Make work 18-27 to 28 Celsius
 - Reach out to those companies to promote those standards.
 - 90.4
 - ASHRAE is not so well established in companies like Spain. Companies don't trust ASHRAE standards.
 - Language is an issue -- Not many people speak English.
 - **Andreas has translated some commissioning materials.**
 - Bigger focus on data centers addressed to the European market. More influential
 - New association of datacom center companies. Just formed
 - Atecyr vs ASHRAE -- Atecyr sees ASHRAE as a competitor.
 - Farooq -- material that is tailored toward the Spanish market.
 - Technical Committee 9.9. Telecommunications
 - Their own standards -- very old.
 - Energy Code in Spain.
 - Building codes in Spain -- LEED is very important in Spain. LEED consultant.
 - Carbon reduction issues? Not yet.
 - Refrigerants and continued training of staff.
 - Question -- heating sector. Are we the problem or the solution. It looks like we are the problem. We should give up comfort.
 - According to the media in the last month. We are the problem. Temperatures are high
 - PR and Marketing issue.
 - F-Gas Reductions -- Current one is not a problem. Translating refrigerant to CO2. F-Gas regulation.
 - In 2027 there will not be enough HFC allowed.
 - Natural refrigerant. HFO.
 - Natural -- CO2 and ammonia. Power consumption is too high.
 - HFO.
 - Directive -- HFO or HF4 produces another acid that is bad for the environment.
 - Link to the temperature regulation. Is there a police behind every user. No teeth. Require improvement of the efficiency of the system.
 - My request to ASHRAE -- can you change the politician's mind.
 - Provide materials to help make the argument. You can save 20-30 percent of the energy. They don't care.
 - Sept. 1st. -- We have to pay taxes on refrigerants. 30 Euros tax. Somebody wants the heating sector to disappear.
 - Because we pay taxes,
 - it is illegal in the UAE to import or mfg a thermostat that goes below a certain level.

- Germany -- 19 degrees .
- Isn't better to improve the efficiency -- Expanding the thermal comfort range in 55.
- Germany -- cannot find the natural gas.
- Refrigerants are a subject that has to be addressed. Europe and Japan. 10 different chillers for 10 different markets.
- we need to have different comments on temperature. Passive is the first 20-30 percent. We need to come up with a PD that discussed the need to replace equipment that is below a certain efficiency threshold.
 - Price is the key driver. Shouldn't be that way. Benefit for the investor and for the Society
 - Initial investment should only be 40-60 percent
- How is public procurement done in Spain? In the middle east. Separate envelopes -- Technical envelop and \$\$\$ envelope.
- Procurement Manager
 - In Norway -- they have a 3rd envelop for
 - Multiple - qualification, technical, price and sustainable.
 - EPD's -- EPD. They don't have a EPD. Not yet. Suppliers have to provide the EPDs.
 - Piping has it.
 - Main contractor challenge -- Some concern about the training and certification of contractor people. Special training of workforce.
 - They are an ECP contractor -- they design, procure, build and operator.
 - Lack of expertise in their companies. Main challenge is with the Designing. In some countries. They use guidelines which results in oversizing the equipment.
 - Volume in air room changes.
 - Trends in the industry -- challenge a consultant.
 - How to avoid oversizing.
 - Challenge the oversizing of the equipment.
 - No particular certificate
 - They are providing training focused on sustainability.
 - LEAN tool for removing waste. They have experience in lean mfg.
 - Farooq -- that is also a comment in Tokyo. Our guidance results in oversizing of the equipment.
 - Oversizing is an issue. They don't want to undersize the equipment. Energy is more important today.
 - Right sizing with the more efficient equipment today.
 - Is evaporative cooling becoming more popular because it is a dry area? No. Not enough water. Legionella is also a threat.
 - Someone is a good cook and someone looks good and you have to make your choices.
 - Heat pumps -- 50% more demand in the past three years.
 - Air -water heat pump for heating cooling.
 - \$100 million in sales per year total heat pumps
 - Underfloor heating using
 - Refrigerant taxes
- Consulting industry help from ASHRAE
 - Situation in Spain is changing
 - When I was in the industry. CO2 footprint. Today, the clients don't care about CO2 footprints. They want cheap design.
 - LEED helps in Spain. 20 years ago ASHRAE was unknown. His friends in other companies. They don't know ASHRAE.
 - A good issue for ASHRAE to teach. Educate. Master. 200 courses.
 - Would it help if that was in Spanish. Took certain parts of the handbook and tailored into a different market.
 - Connect with universities and encourage them to use ASHRAE standards. Universities are not using handbooks in Spain. They will use that material for their company.
 - Engineers want to be a business consultant for Price Waterhouse rather than go into engineering.

- In Italy they banned air curtains.
- We should focus more on gov't affairs.
- No ventilation in the schools.
- It is a policy issue
- Turkey -- Engineers always want to go to the big, secure companies. They move to those countries.
- Most of his friends. 20 close friends. Only 5 still live in
- ASHRAE courses -- In Spanish.
- Physical is always preferred. Vs. Virtual.
- Local instructor vs outside instructor.
- Materials don't have to be in Spanish. They can be in English. However, the instructor should definitely speak Spanish.
- HVAC focus --
- New degrees -- three year technical degrees called an engineer.
- Spain -- HVAC engineers is not appreciated. Sometimes called plumbing.
- Marketing campaign.
- The A in ASHRAE causes some issues.

Appendix D. Excerpted Raw Notes from RAL Roundtable (Istanbul)

- Issues that need to be addressed
- Supply Chain
- Human resources
 - Definition of mechanical engineering
 - Who's the engineer
 - Application education -- They don't learn what they need to practice
- Conformity of standards
- Accounts Receivable
- In Turkey
 - No professional engineering association. No license needed
 - Liability insurance not available
- Technology developments -- If they don't use technology in the future
 - Conduct tests based on latest technology. Process automation.
- Standards -- Using different standards. ISO standards. Uniformity of standards is an issue.
- MFGs -- Improve standards to include innovative products. Standards don't cover the new generation of products and services
 - Lack of flexibility of standards
- Localization of standards.
- Need to transition from Prescriptive standards to performance standards
 - Prescriptive standards are innovation killers.
 - IEQ in homes. No outside air requirement for homes.
 - Can help remedy
- Standard for IEQ for homes.
 - Ventilation standard 62.2
- Lack of electrified systems in building.
 - Can the building operator actually run the building
 - Heat pumps or hydronic systems.
 - Martin -- prices are too low in the U.S. to drive people to use more energy efficient.
 - In Europe we have a energy label that is driving the customer.
 - Building codes are driving towards higher efficiency.
 - 100 kw/sq m/
- Coordination of contractors with architects
- They use BIM when the contractor requires it.
 - Local mfgs don't have the objects for including their equipment in BIM.
- Helping small enterprises to create the library for BIM work would be a good idea.
 - BIM liability
- Lack of third-party research on new technologies
- BIM. ASHRAE advocate for BIM for 20 years. Contractors get more benefit out of BIM.
- R&D part of a mfg company -- They need to meet with engineers and designers to understand what they really need.
- Middle east REVIT is standard, but in Pakistan not the case. REVIT operator is very expensive. Price out of market. Need affordable access to tools that drive BIM.
 - In price sensitive markets. Designing accuracy to avoid over-sizing.
 - Price over quality design. Low first cost.
- EPDs?
 - Adding life cycle assessment in our software. System Air.
 - Swego -- Do life cycle assessment. Embodied carbon in the product itself.
 - Daikin -- In France they require an environmental passport
 - Energy efficiency
 - Embodied carbon is included
 - Opportunity for ASHRAE to create environmental passport for products.
- They need to function as system. Lack of systems approach.

- How can ASHRAE do things better?
 - Categories
 - Standards
 - HR and Workforce Development
 - Licensing/Certification -- Not applied in Turkey. Customers are not asking
 - How much of ASHRAE resources
 - Standards are commonly used for cooling. Heating is European ISO standards and CEN standards.
 - Heating is more dominant.
 - Human Resources (application education)
 - Proposal for the TTMD. AASA member.
 - Educate people. TTMD and ASHRAE can cooperate.
 - Language is a barrier -- Turkish.
 - Train the Trainer would be helpful.
 - Printed materials can be written in English. Spoke Turkish. Marginal.
 - \$240 is 60% of the monthly wage.
 - 7,500 is average salary. GDP.
 - Who are we training -- design engineers in the manufacturing sector.
 - Farooq -- Training center in Dubai. Training center in Turkey? No members
 - 251 active members in Turkey
 - Half of those students.
 - Can we induce the employers to pay for dues.
 - Dues are too expensive
 - Standards
 - Need to be open for innovation
 - Lack of flexibility and performance-based standards
 - Lack of third-party verification
 - Lack of local adaptation
 - Conformity
 - IAQ in homes
 - Prescriptive standards are better for U.S. code standards.
 - Localization
 - After COVID-19, war, etc.
 - Supply chain and distribution have to become localized matters
 - 90.1 -- What is the baseline in the U.S.?
 - LEED is very popular in Istanbul. But it is
 - New hospitals 24 -- some are built to ASHRAE standards.
 - Translation of standards.
 - TTMD has the right to translate ASHRAE standards -- agreement. They have translated many standards into Turkish.
 - Certification
 - No professional licensing for engineers.
 - Certified HVAC Designer Certification.
 - Have encouraged
 - Chamber of Mechanical engineers -- \$10 to be a member of the Chamber. If they are member. The government is hesitating to organize the PE system. Why would they listen to us.
 - GO to the government and advocate for professional licensure.
 - They do not want certification.
 - Advocate to the ministry to get our certification accepted.
 - Only 4 people certified by ASHRAE. Certification.
 - Localization of certification programs.
 - Professional engineer -- They want a requirement.
 - Lack of guidance for all-electric central plants.
 - Electricity is very high in Turkey.

- Climate is cold.
 - 1st cost carries the day.
 - Not an issue -- skip
- Contractor/Designer Cooperation
 - Can ASHRAE help?
 - Do workshops like this one.
 - Zeki is the turkey contractor association president. He calls them together in a workshop.
 - No commissioning in Turkey, but there is a lot of testing and balancing for about 30% of the building.
- BIM
 - ASHRAE standard 224 is in the final stages of getting completed.
 - Doing that jointly with NIBS.
- EPD's
 - Small companies -- they don't know how to do the LCA calculation. Don't have the resources.
 - Eurovent -- Some associations are driving
 - LCA vs. EPD's.
 - Passport
 - UK, France, EU will have a unified program.
 - EPD's -- Alignment of EPD's in NA and in Europe.
- LFI -- Living Future Institute.

Appendix E. Excerpted Raw Notes from 2023 Winter Conference Roundtable (Atlanta)

- What is the most critical condition that is currently impacting our industry and how can ASHRAE help?

Buildings (higher education and healthcare in particular) are different ages. Difficult to cross-reference which Standard any given building and any given equipment/system is applicable. Would like ASHRAE to help operators know what they need to do and why. Owners are biggest users.

ASHRAE can provide education/training for operators and technicians and facility managers. Outreach designed for getting owners more involved in ASHRAE.

ASHRAE does a good job of reaching out to core membership. Opportunity for outreach to owners, developers, other high-level influencers.

Need to emphasize health and safety in existing buildings, not new buildings. Need to figure out guidelines for controls and sequences for existing buildings, especially for energy efficiency and reopening schools and other facilities that were hit hard by the pandemic. Need to push technology staff in firms.

Pushing software side of building operations and performance, but have to keep network secure.

ASHRAE can help with making nomenclature for equipment and systems consistent.

Industry is evolving. Buildings and owners need to evolve with the industry.

ASHRAE can offer workforce development. As industry shifts to global view, is important to help individual engineers understand how their work fits into the big picture.

For example, in HVAC Essentials, show attendees the part of the building being discussed. Possibly could have fewer PPT slides and make the training more interactive.

Long-term plan is to have a learning center in the HQ building to provide a more interactive, more hands-on experience.

Need more integration between designers and operators.

Young engineers need to be able to problem-solve onsite. Consulting engineers need to bring together “book learning” and “field sense.”

In future, engineers will do less designing and more problem-solving and real-world work on buildings. ASHRAE can help with that type of training.

Some firms use virtual reality to plan getting chillers on roofs in metropolitan area, for example.

Need to look at business side: expected to do more with less, faster. HVAC&R isn't seen as a “sexy” option for young engineers. Have to make the business case for energy efficiency and better buildings.

Also, need to look at capability of operators and facility managers because buildings can be overbuilt for their abilities. ASHRAE could provide training to connect the dots.

ASHRAE can help make HVAC&R more appealing and attractive.

ASHRAE could provide guidance that the government requires. Then the firms could charge more and pay more.

ASHRAE can do better in providing global solutions.

Need O&M manual standard. Standard spec by equipment type (e.g., for chiller, air handler). O&M manuals typically come from manufacturers – would they like guidance on what should be in the manual on how that piece of equipment fits into a system?

ASHRAE needs to help end users understand the “why” of some requirements in our standards. ASHRAE is complicating buildings in ways that might not be necessary or realistic. ASHRAE standards lead to overdesign.

What is the role of artificial intelligence for ASHRAE and the industry?
Should ASHRAE look at strategic application of AI?

ASHRAE could provide connection between technology and real-life.

Get ASHRAE’s technical knowledge and data into AI software

Many consulting engineers and firms are investing in automating tasks that had been more manual. Can ASHRAE help with this transition?

Can ASHRAE help small design firms integrate technology into their work processes?

If technology/software generates designs that owners can’t operate, that’s not helpful. How do we get the owners to understand and approve what the industry wants to do?

ASHRAE can lead the way in the evolution of the design/consulting engineer’s job.

Need more integration across industry segments to determine the building industry’s future. Need diversity of thoughts, insight, and input.

Participants’ Key Take-aways for ASHRAE

Listen to the industry and take action

Adapt to technology

Workforce development: training should be appropriate (e.g., more interactive and hands on)

Existing building stock: how to address greenhouse impacts

Must address funding for improving energy efficiency, workforce development, etc.

Have industry roundtable at each CRC

Summary: ASHRAE can provide

Training/Education/Workforce Development

Outreach to make the building industry sexy; industry professionals already are sexy

Opportunities for connecting design with operation in real-life, in current environment and in the future that will be more technology-driven

Standardization, perhaps through AI, for controls

Influence to move industry forward

Preparation for engineers for the future

Mechanisms for change – reinforce that change is good!

REPORT TO THE BOARD OF DIRECTORS
From the BOD DEI Advisory Subcommittee
As of January 18, 2023

Recommendations for Board Approval:

No motions

Committee Progress on Initiatives:

1. Matters relating to diversity, equality, and inclusion - with a view to improving organizational awareness and performance in these areas amongst both staff and the Society membership. (70% complete)
 - Continue with BOD and leadership training received quotes for additional training from Fundamental Advisory. Three staff (1 director level and 2 staff level) [3-hour trainings](#) for ASHRAE staff planned, director and manager training [complete](#), *Note: Staff Leadership training was overall favorable and should be included every year.* Staff training is scheduled for March 2023.
 - Continued BOD members book club, reviewed all chapters of the book “The Blindspot” and held a wrap up meeting to discuss learnings from the book and what we can take forward to our ASHRAE teams. Ongoing with new books selected.
 - DEI video webpage created and 2 videos are available for membership. DEI ambassadors identified for 11 regions (3,4, 6 and 7 have not identified ambassadors) have been requested to introduce the videos to the chapters in their region. See item 3 below for details.
2. Develop a DEI strategic plan prioritizing DEI issues and establish annual budgets for the DEI program. (90% complete)
 - BOD DEI SC prioritized training needs, established working relationships with CIBSE and INWIC, and set up liaisons to major standing committees.
 - Signed a contract with Fundamental Advisory for 4 videos (3 in this fiscal year and 1 next fiscal year) for membership training and 3 Zoom training sessions for director/manager training and staff training.
3. Recommend to the BOD policies to increase and improve inclusion within ASHRAE and the HVAC&R Industry and help the Society meet its commitments to fairness and equal opportunities. Recommendations would be expected to apply to:
 - Appointments (100% complete) Nominating Committee liaison reminded Nominating committee members to be aware of DEI and unconscious bias during nominating process in November.
 - Honors and Awards (5% complete) Wei Sun - will be looking for ways to incorporate DEI into H&A. Will review DEI concepts and definitions. No update.
 - Technical Group Membership (5% complete) Tech Council and Membership Council liaisons. Tech Council liaisons are Steve Sill, Ashish Rakheja and Susanna Hanson; Tech Council members advised they need to report to Steve and update committee actions they are taking in regard to DEI. No update.
 - Volunteer Engagement Membership promotion liaison (100% complete) MP has indicated that they would like to be involved with DEI since they see this as their responsibility.
 - Chapter program and initiatives (100% complete) Created a DEI video webpage that requires an ASHRAE login to access. Added the following phrase at top of website to increase copyright protection. **“The videos on this page are for internal ASHRAE use only and are not to be copied or shared outside of ASHRAE due to copyright laws. To copy or otherwise share the videos outside of ASHRAE would be considered a violation of the ASHRAE Code of Ethics.”** Link to webpage: [ASHRAE videos](#).

4. Monitor inclusion within the Society and develop appropriate metrics for evaluation. (50% complete)
 Membership promotion liaison
 Eileen Jensen assigned as a liaison to MP to MC from DEI SC and will request a meeting of MP for feedback. Feedback from subcommittee: Input from DEI sub-committee:
 1. Fear of approaching principals for 5 days paid company time to attend.
 2. Don't want to leave young families at home.
 3. Perceived lack of quality technical seminars
 4. Cost of hotel and airfare minimum of \$2500 USD for 3 days - hosting meetings in major airline hub cities may help.
 5. Scholarships to conferences (Leadership U and LeadRS) help
5. Keep under review the Society's policy and practices relating to equity and diversity. (90% complete)
 Annual review of ROB and BOD MOP DEI SC Reference Manual is 90% written; SRC is updating ROB, MOP and Reference Manual for generic "Companion" terms after it is determined what they should be.
6. Facilitate communications between ASHRAE and other relevant organizations, and to work in collaboration with them, to promote and embed inclusion and diversity in the engineering, construction, and related sectors. (70% complete)
 - Meet with CIBSE twice a year to share best practices; coordinating meetings with CIBSE for 2023 meeting (second meeting).
 - Support board member and alternate for INWIC. Sarah Matson is a board member representing ASHRAE and Sheila Hayter is the alternate.
7. Recommend Chapter and Society programs on DEI (webcasts, training and education program, Insight Articles, forums, conferences, and webinars) (70% complete)
 - Create 2 articles a year for DEI in Journal or other publications, on-going; No action.
 - Forum approved for Atlanta meeting ASHRAE Cultural Mixer: Monday, February 6, 2023, at 11:00 AM to 12:00 PM. The main goal of this session is to understand and appreciate each other's culture and develop cross-culture solidification within our Society. This cultural mixer develops camaraderie among ASHRAE members.
8. Recommend publication and showcasing the work of inspirational HVAC&R engineers from under-represented groups. (0% complete) No action.
9. Help develop/source society training programs for members on DEI including, but not limited to; (90% complete)
 - Created 2 PowerPoint presentations, "DEI Foundations", and "Understanding Implicit Bias & Unconscious Bias", **complete**. Added to DEI videos webpage and it will be available for presentation at Regional and Chapter meetings. "Micro Aggressions" a third presentation will be added in Q1 2023.
 - Creation of 2 additional PowerPoint presentations, "Cultural fluency and cultural competency" and "Equity versus Equality" to be created by Fundamental Advisory, recorded and available for presentation at Regional and Chapter meetings in **society year 2023-2024**.
10. Develop a manual of procedures, and ROB for the committee. (90% complete) Reference Manual is 90% written.

Date

Chair



REPORT TO THE BOARD OF DIRECTORS FROM
THE BOD DEI ADVISORY SUBCOMMITTEE
JANUARY 18, 2023

Chair: Adrienne Thomle

DEI INITIATIVES

1. Matters relating to diversity, equality, and inclusion - with a view to improving organizational awareness and performance in these areas amongst both staff and the Society membership. **(70% complete)**

- Continue with BOD and leadership training
- Three staff (1 director level and 2 staff level) 3-hour trainings
- Director and manager training complete, *Note: Staff Leadership training was overall favorable and should be included every year.*
- Staff training is scheduled for March 2023.
- Continued BOD members book club, reviewed all chapters of the book “The Blindspot”
- Held a wrap up meeting to discuss learnings from the book and what recorded learnings we can take forward to our teams.
- Ongoing with new books selected
- DEI video webpage created and 2 videos are available for membership. DEI ambassadors identified for 11 regions (3,4, 6 and 7 have not identified ambassadors) have been requested to introduce the videos to the chapters in their region.



DEI INITIATIVES continued...

2. Develop a DEI strategic plan prioritizing DEI issues and establish annual budgets for the DEI program.

(90% complete)

- BOD DEI SC prioritized training needs, established working relationships with CIBSE, NIBS and INWIC, and set up liaisons to major ASHRAE standing committees.
- Signed a contract with Fundamental Advisory for 4 videos (3 in this fiscal year and 1 next fiscal year) for membership training and 3 Zoom training sessions for director/manager training and staff training.



DEI INITIATIVES continued...

3. Recommend to the BOD policies to increase and improve inclusion within ASHRAE and the HVAC&R Industry and help the Society meet its commitments to fairness and equal opportunities.

Recommendations would be expected to apply to:

- Appointments (**100% complete**) Nominating Committee liaison reminded Nominating committee members to be aware of DEI and unconscious bias during nominating process in November.
- Honors and Awards (**5% complete**) Wei Sun - will be looking for ways to incorporate DEI into H&A. Will review DEI concepts and definitions.
- Technical Group Membership (**5% complete**) Tech Council and Membership Council liaisons. Tech Council liaisons are Steve Sill, Ashish Rakheja and Susanna Hanson; Tech Council members advised they need to report to Steve and update committee actions they are taking in regard to DEI.
- Volunteer Engagement Membership promotion liaison (**100% complete**) MP has indicated that they would like to be involved with DEI since they see this as their responsibility.
- Chapter program and initiatives (**100% complete**) Created a DEI video webpage that requires an ASHRAE login to access. Phrase added at top of website to increase copyright protection. Link to webpage: [ASHRAE videos.](#)



DEI INITIATIVES continued...

4. Monitor inclusion within the Society and develop appropriate metrics for evaluation. (75% complete)

Membership promotion liaison

- Eileen Jensen assigned as a liaison to MP to MC from DEI SC. Input from DEI sub-committee:
 1. Fear of approaching principals for 5 days paid company time to attend.
 2. Don't want to leave young families at home.
 3. Perceived lack of quality technical seminars
 4. Cost of hotel and airfare minimum of \$2500 USD for 3 days - hosting meetings in major airline hub cities may help.
 5. Scholarships to conferences (Leadership U and LeaDRS) help



DEI INITIATIVES continued...

5. Keep under review the Society's policy and practices relating to equity and diversity. (90% complete)

Annual review of ROB and BOD MOP DEI SC

- Reference Manual is 100% and approved by DEI committee;
- SRC is updating ROB, MOP and Reference Manual to change "spouse" to "spouse or live-in companion"

6. Facilitate communications between ASHRAE and other relevant organizations, and to work in collaboration with them, to promote and embed inclusion and diversity in the engineering, construction, and related sectors. (80% complete)

- Meet with CIBSE twice a year to share best practices; coordinating meetings with CIBSE for 2023 meeting (second meeting).
- Support board member and alternate for INWIC. Sarah Matson is a board member representing ASHRAE and Sheila Hayter is the alternate.
- Adrienne Thomle participated in NIBS round table for "What does the built environment look like in 2023"



DEI INITIATIVES continued...

7. Recommend Chapter and Society programs on DEI (webcasts, training and education program, Insight Articles, forums, conferences, and webinars) (70% compete)

- Create 2 articles a year for DEI in Journal or other publications, on-going; (No action)
- Forum approved for Atlanta meeting ASHRAE Cultural Mixer: Monday, February 6, 2023, at 11:00 AM to 12:00 PM. The main goal of this session is to understand and appreciate each other's culture and develop cross-culture solidification within our Society.

8. Recommend publication and showcasing the work of inspirational HVAC&R engineers from under-represented groups. (0% complete) No action.



DEI INITIATIVES continued...

9. Help develop/source society training programs for members on DEI including, but not limited to; **(90% complete)**

- Created 2 PowerPoint presentations, “DEI Foundations”, and “Understanding Implicit Bias & Unconscious Bias”, and added to DEI videos training webpage for presentation at Regional and Chapter meetings **complete**.
- “Micro Aggressions” a third presentation will be added in Q1 2023.
- Creation of 2 additional PowerPoint presentations, “Cultural fluency and cultural competency” and “Equity versus Equality” to be created by Fundamental Advisory, recorded and available for presentation at Regional and Chapter meetings in **society year 2023-2024**.

10. Develop a manual of procedures, and ROB for the committee. **(100% complete)**

Reference Manual is complete and approved by DEI committee.





Board Subcommittee on
Financial Focus
Updated Report to the BOD

M. Dennis Knight, Treasurer
February 4, 2023

Recap of Goal

“The primary goal is to shift ASHRAE’s decision making philosophy from an accounting-based approach to a financially based approach and to accomplish this by making changes necessary to infrastructure and process.”

- There are many reasons to make decision, the focus is just on the financial portion



Charge - Three Deliverables/Status

1. Refine/Develop Financial Analytics – **Complete – And!**
2. Establish Limits of Authority - **Ongoing**
3. Refine/Develop Financial Requirements for New Proposals - **Ongoing**



FINANCIAL FOCUS SUBCOMMITTEE OF THE ASHRAE BOARD OF DIRECTORS

MEMBERS

Dennis Knight – Chair
Art Giesler – Vice Chair
Chen Wee Leong – Member
Bryan Holcomb – Member
Steven Sill – Member
Wade Conlan – Member
Mark Tome – Member
Hugh Crowther – Consultant
Craig Wright – Staff Representative

1.0 BACKGROUND

ASHRAE has a well-established financial accounting system and reporting process that provides timely and accurate accounting information to the Board, Councils and Committees. For Example, it is easy to access the cost and revenues associated with the Board, Councils and Committees within the financial reports produced by our Director of Finance and our accounting staff.

The Accounting structure is set up to mimic the organizational structure which is ideal for cost accounting and management.

The Finance team and the department heads have an intimate understanding of their finances and the advantage of institutional memory which can be made available to volunteer decision makers. However, it is ad hoc, which consumes valuable staff time, slows down the availability of the information and is not likely consistently calculated between reporting periods. For example, the Director of Finance and their team has to pull financial data from several internal software systems and from external vendor reports (such as from TechStreet for bookstore sales).

The Financial wellbeing of ASHRAE requires that the best financial analytics be provided to staff and volunteer decision makers in a timely and in a reliable and repeatable fashion (format). There will always be a huge list of ways that ASHRAE can add value and meet its commitment to our members, the industry and to society, only with good tools can ASHRAE leadership deliver on its promises in a financially sustainable way.

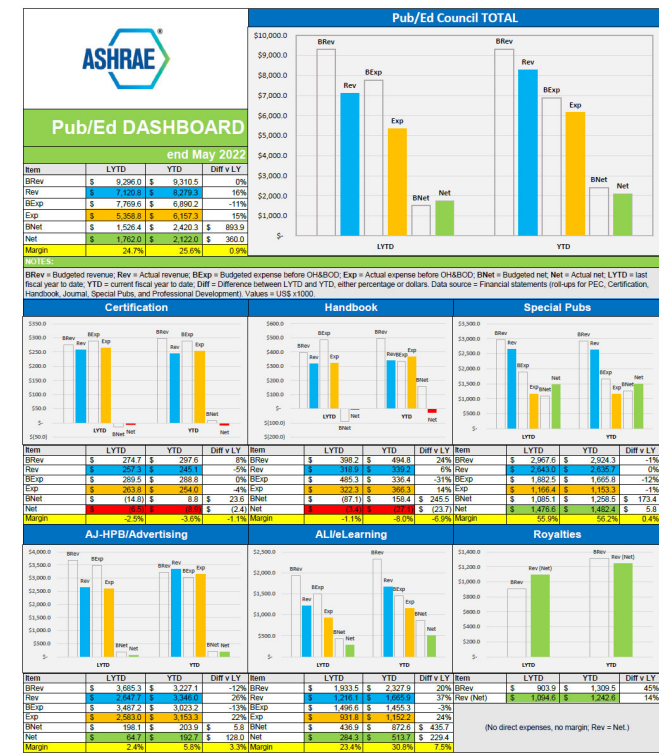


Refine/Develop Financial Analytics

WG1 – Bryan Holcomb, Chair; Mark Tome, Member

1. Work with Finance Committee, Staff & Volunteers.
2. Develop a comprehensive list of financial analytical measurements. - **Complete**
3. Develop a set of KPIs to be used by the BOD. - **Complete**
4. Receive proposals from outside vendors, if necessary, to implement a software solution. – **Staff Continues to Investigate Alternatives**
5. Timeline: Complete by winter meeting in Atlanta, January 2023. - **Complete****

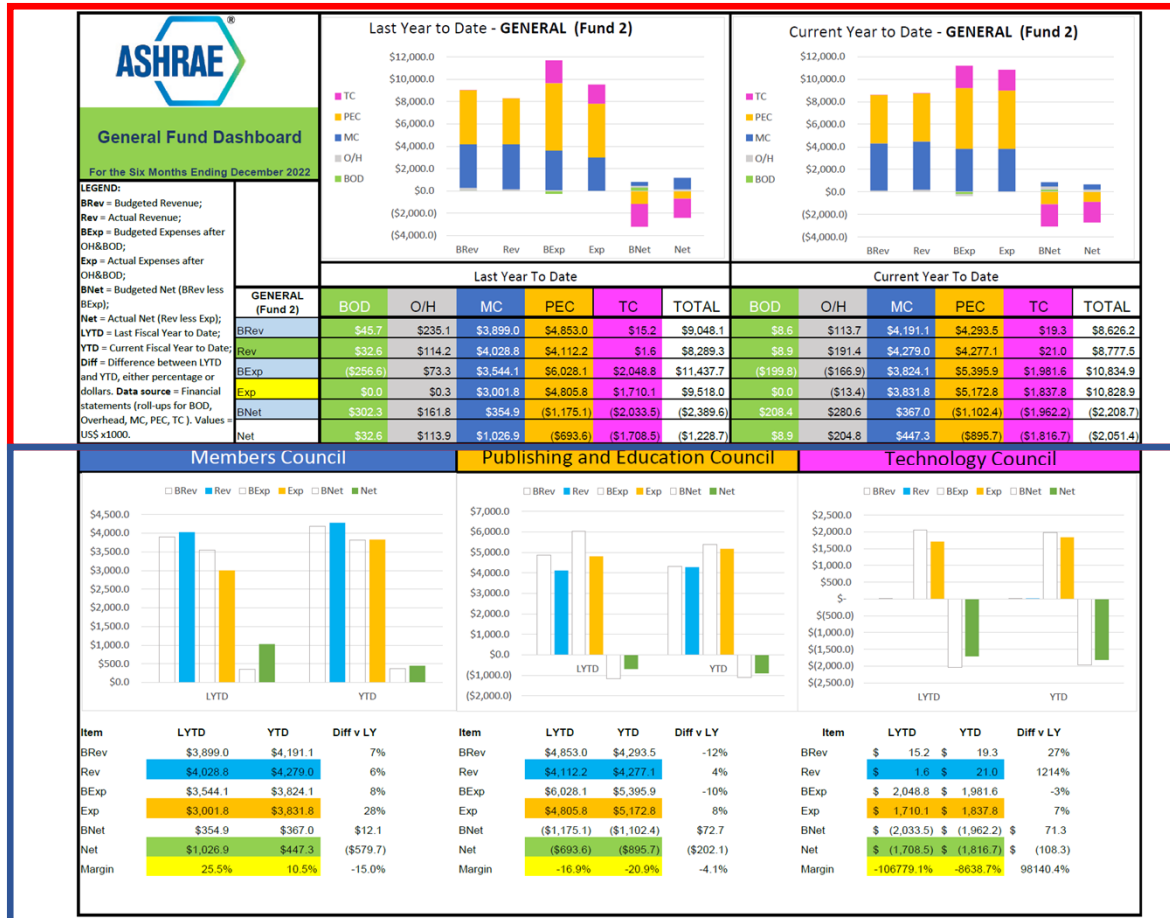
** Workgroup as an additional charge will seek input from the Board and Finance Committee after Atlanta meeting on whether the KPIs in the new dashboard are appropriate and determine if they need to be modified or new one added by Summer meeting



Analytics in form of Dashboard



Dashboard



Dashboard

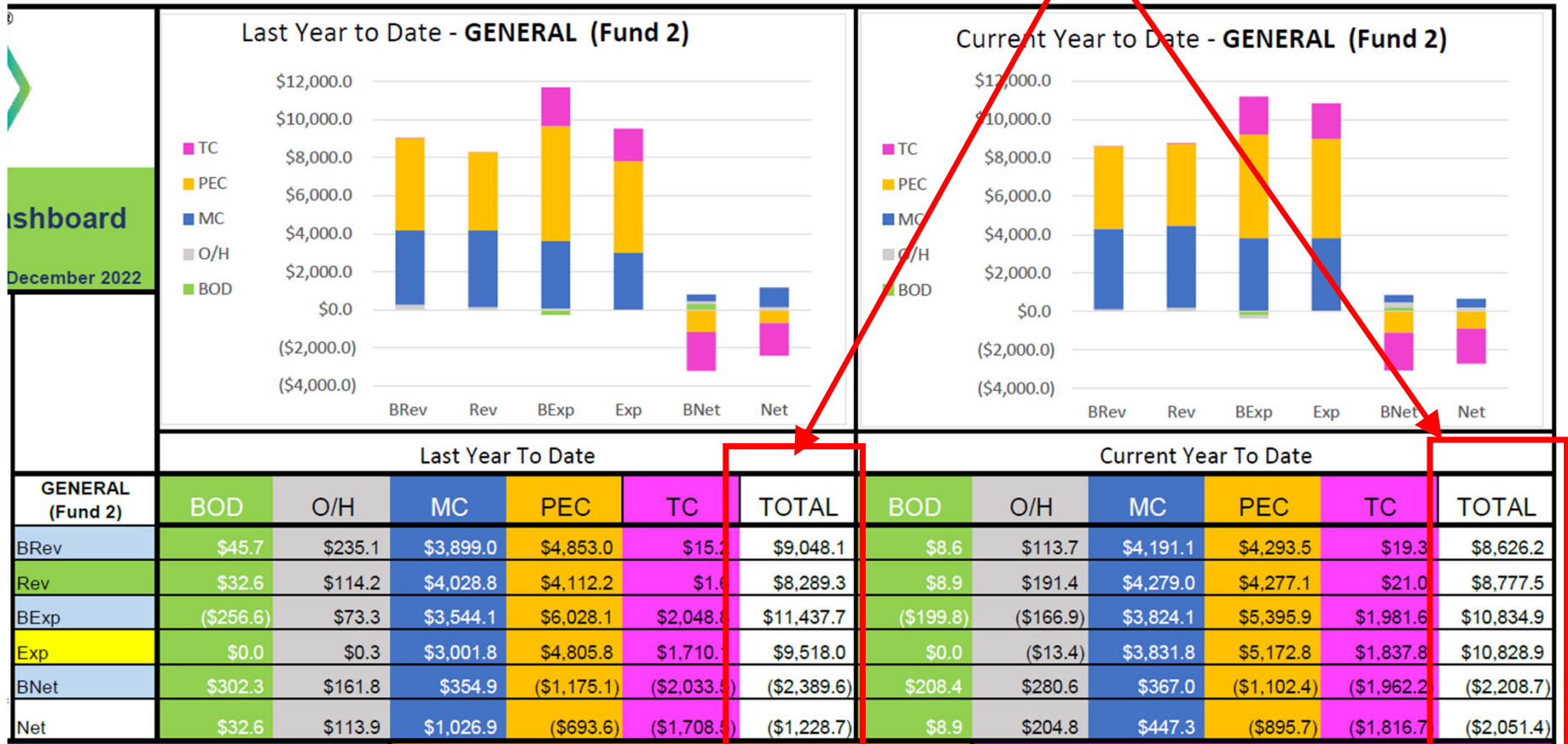
General Fund Dashboard	
For the Six Months Ending December 2022	
LEGEND:	
BRev = Budgeted Revenue;	
Rev = Actual Revenue;	
BExp = Budgeted Expenses after OH&BOD;	
Exp = Actual Expenses after OH&BOD;	
BNet = Budgeted Net (BRev less BExp);	
Net = Actual Net (Rev less Exp);	
LYTD = Last Fiscal Year to Date;	
YTD = Current Fiscal Year to Date;	
Diff = Difference between LYTD and YTD, either percentage or dollars. Data source = Financial statements (roll-ups for BOD, Overhead, MC, PEC, TC). Values = US\$ x1000.	
	GENERAL (Fund 2)
	BRev
	Rev
	BExp
	Exp
	BNet
	Net

See Financials for General Fund 2, Columns A, B, C, & D

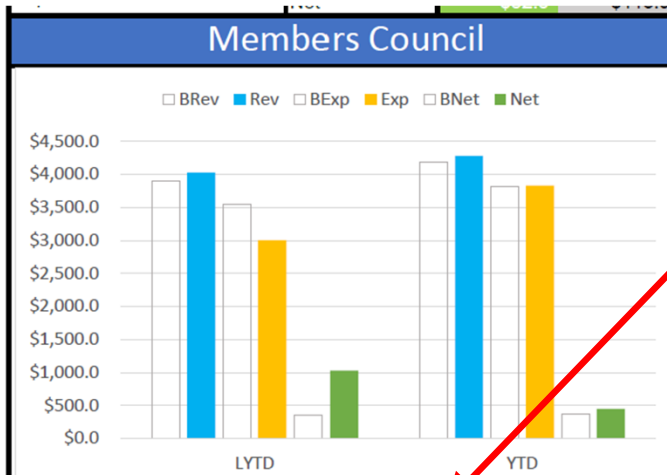


Dashboard

See Financials for General Fund 2, Columns A, B, C, & D



Dashboard



These numbers are rolled up from accounts in the financials or from our accounting software.

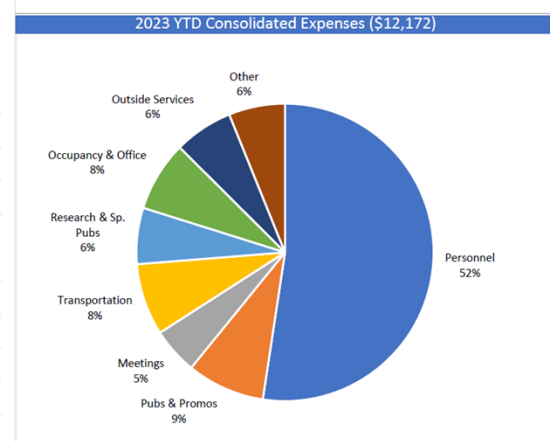
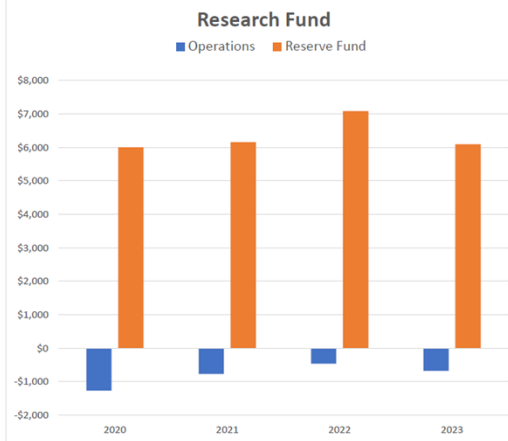
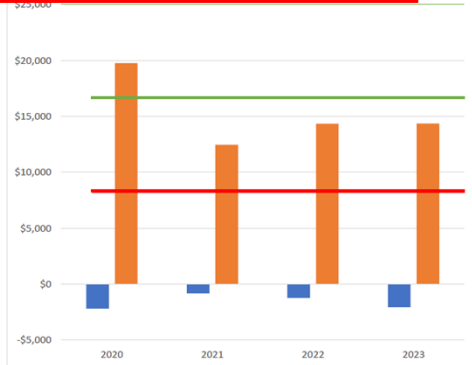
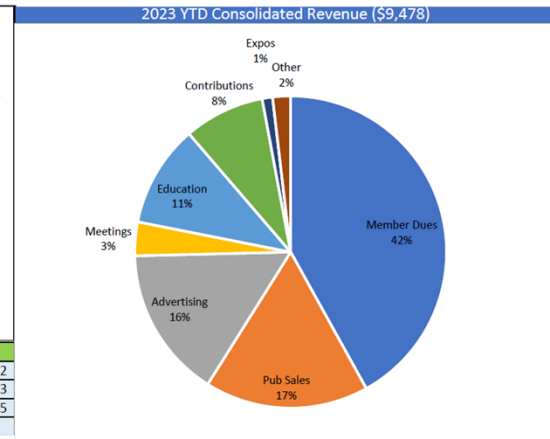
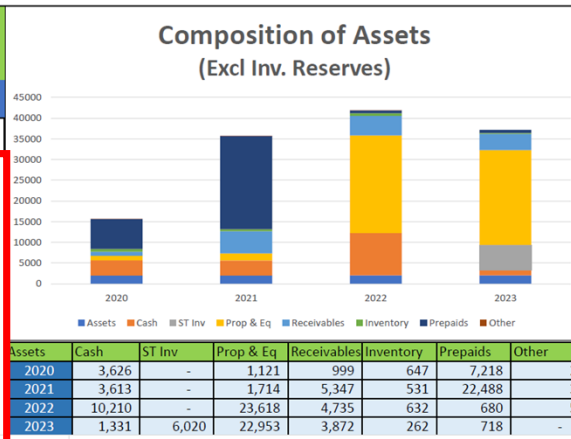
Item	LYTD	YTD	Diff v LY
BRev	\$3,899.0	\$4,191.1	7%
Rev	\$4,028.8	\$4,279.0	6%
BExp	\$3,544.1	\$3,824.1	8%
Exp	\$3,001.8	\$3,831.8	28%
BNet	\$354.9	\$367.0	\$12.1
Net	\$1,026.9	\$447.3	(\$579.7)
Margin	25.5%	10.5%	-15.0%



Dashboard



Highlight Value



Establish Limits of Authority

WG2 – Art Giesler, Chair, Steven Sill, Member

1. Create a Limits of Authority Document for:
 - a. Financial Limitations
 - b. Legal Limitations
2. Covers
 - a. BOD & ExCom
 - b. President
 - c. Staff Executives and Directors
 - d. Council and Committee Chairs
3. Timeline: Ongoing – anticipated complete by late spring 2023. **

**Workgroup has done a thorough review of previous work in addition to the Rules of the Board and Finance Committee Manuals. The WG is in the process of collating all information on LOAs into a single document so that it can be reviewed with the groups covered by the Charging Document.

Financial LOA

Legal LOA

New Representative Contracts

All new representative agreements must be reviewed and approved by the President

Back Charges/Credits to Customers

This includes any credits issued to customers resulting from a back charge, customer goodwill, or sales concessions

Up to \$2,000	Management level for project managers
Up to \$10,000	VP of the BU
Over \$10,000	President

Credit terms to customers

This is for any credit extended beyond limits given by Atradius

Up to \$10,000	Accounts Receivable
Up to \$20,000	Controller
Up to \$50,000	VP of Finance
Up to \$130,000	President

Contracts obligating the company to greater than \$50,000

Must be reviewed and approved by the President

Capital Acquisitions/Disposals- all capital purchases require a Capital Investment Proposal (CIP) form to be completed. This form includes an analysis and justification of the benefits and savings for all capital purchases.

All Capital purchases must have two signatures.

Up to \$30,000	Executive of functional area & VP Finance/IT
Up to \$75,000	Business Area President & VP Finance/IT
Up to \$300,000	CEO & CFO

Typical LOA



Refine/Develop Financial Requirements for New Proposals

WG3 Wade Conlan, Chair, Cheng Wee Leong

1. Refine/Develop Financial/Fiscal Impact Requirements for:
 - a. All new products proposals
 - b. All new services proposals
2. Process should consider:
 - a. Size of the request
 - b. Complexity of the request
3. Timeline: Complete by annual meeting June 2023**

** Wade and Cheng Wee have met with Hugh and then met independently several times. They have gathered all the most recent tools that have been proposed to the Board, Councils and Committees in recent years and are seeking input from committee chairs on the usefulness of each tool and process. They anticipate having the work complete and recommendations for a consolidated tool and process just before the Annual meeting in Tampa.

INTRODUCTION					
Not all new ASHRAE products and services need to be financially successful but they must add value for the members and society at large					
The ASHRAE score card is used to evaluate how and where a potential new product or service can add value that will not be measured financially					
This form should be filled out for all proposed programs.					
The scorecard will be used to recognize how a program adds non financial value and to help prioritize ASHRAE activities.					
HOW TO USE THIS FORM					
The Scorecard has 8 dimensions. Pick the value that best indicates where the proposed product or services fits within					
Additional notes can be added (but are not required) for each dimension					
Additional notes can be added at the bottom of the form (but are not required) for details not covered by the dimensions.					
SCORECARD					
DIMENSION					
1	With regards to the initiatives of the 2019-2024 Strategic Plan, this product/service is:				
	Independent area of focus			Directly Supporting	
	1	2	3	4	5
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
2	Non members of ASHRAE will view this project/service as:				
	Valuable mainly to the owners and practitioners of HVAC&R			A significant contribution to Society, generally.	
	1	2	3	4	5
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
3	For ASHRAE Members, this product/service provides :				
	Topic-specific guidance, technical tools, or information			Professional Growth Opportunity or career skill development	
	1	2	3	4	5
	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



What is the value of this work?

- Analytics will let decision makers understand how ASHRAE is (financially) performing
 - What is changing (for better or worse)
 - Where there are issues and opportunities
 - The BOD needs these tools to act strategically (Streamlining)
- LOA will empower the organization
 - Everyone knows what they can and cannot do independently
 - Major step in streamlining
- Financial requirements for new projects will let decision makers rank the best ideas
 - We can't do every great idea
 - We don't have to make money on every program but we better know what it will cost to deliver



Work Complete Since 10/15/2022 Board Meeting

- Dashboards and KPIs – complete and were included in the first set of consolidated dashboards presented to the Board in January 2023. This workgroup will receive comments from the Board on the dashboard and KPIs and make recommendations, if needed, for modification by the summer meeting.
- Finance Committee has been kept in the loop and continue to work on LOAs in addition to the work of this Subcommittee. Work is ongoing and will be complete in late spring 2023.
- Discussions on Financial Focus were held at CRCs and at the Members Council Fall Meeting with respect to the use of budgeting tools and financial reporting tools. Wade and his subcommittee met twice in December, and he has met with Craig to better understand the budgeting tools and processes that have been used in the past. Work is ongoing and will be complete in late spring 2023.



Subcommittee Membership

Dennis Knight – Chair

Art Giesler – Vice Chair

Chen Wee Leong – Member

Bryan Holcomb – Member

Steven Sill – Member

Wade Conlan – Member

Mark Tome – Member

Hugh Crowther – Consultant

Craig Wright – Staff Representative



Questions???





15D

BOD OPEN SESSION AGENDA SUNDA 2023 FEB. 5

Streamlining 2022-23

Continuous Improvement for Councils and Standing Committees

Sarah E. Maston- Chair
Andres Sepulveda- Vice Chair

BOD Subcommittee for Streamlining

Discussion Team Leaders

- Members Council: Eileen Jensen, Richie Mittal
- Pub&Ed Council: Chris Gray, Jim Arnold
- Technology Council: Tyler Glesne, John Constantinide
- BOD/ Excom Std Cmtes: Andres Sepulveda, Kim Mitchell, Tim Wentz

With assistance from staff members Joyce Abrams (MC), Mark Owen (PEC), Stephanie Reiniche (TC), and Kirstin Pilot



Why Are We Here?

Goals

- Free the Board/ ExCom for strategic operations
- Eliminate silos and speed up decision making
- Push decision making lower down in the organization
- Be market focused
- Remove the waste/ reduce operating costs



Questions for Consideration

Scope

- Who should report to the BOD?
- How many councils should we have?
- What should ExCom's role be?
- Questions on committee reporting structure will be taken up at the council level.



Approach

- The streamlining efforts of the last few years have had over-arching goals that would be difficult to get implemented in a short timeframe.
- We have engaged our council leadership to listen to their concerns/ difficulties and try to work with them to implement solutions.
- We are focusing on making changes at the council level with the council leadership.
- Changes at the BOD level will be smaller in scale
- Trying to take smaller bites of the elephant, to see if we can find some success.



Continuing the Conversation

- In November our SC groups meet with council leadership to hear what they had to say... Where were there pain points? How can we make the process better?
 - Here in Atlanta, our groups are discussing possible solutions to those issues with the council leadership. Looking for their buy-in and willingness to make improvements.



Continuing the Conversation, pt 2

- In January, we met with all BOD members to hear their thoughts on:
 - What should the BOD's primary mission be- strategic or operational?
 - Should Excom exist? If so, what should its role be?
 - Who should report to the BOD?
 - How many councils should we have and why?
 - What is ASHRAE's market?
- Since we did these meetings in smaller groups to facilitate good discussion, it was more difficult to get a “big picture” view, so I would like to do some live polling now.



Live Poll on PollEv.com (1)

- What should the BOD's primary mission be- strategic or operational?
 - More operational than strategic
 - More strategic than operational
 - Equal parts operational and strategic
- If the BOD is to be more strategic, who should NOT report to the BOD?



Live Poll on PollEv.com (2)

- Should Excom exist? If so, what should its role be?
 - Day to day operations of Society
 - Define strategic issues for further BOD discussion
 - Same role as BOD- only convene if BOD cannot
- How many councils should we have?



Work Left To Do

- Further discussions with council leadership here in Atlanta. SC groups to present draft recommendations to address council process/ structure difficulties.
- Draft ideas for BOD changes, based on BOD discussions.
- Present draft report for spring BOD meeting, detailing proposed council and BOD changes, with implementation plan.





Questions? Comments?

Email Sarah Maston at sarah.maston@collierseng.com

**Report to Board of Directors
From Task Force on Building Decarbonization ExCom
February 6, 2023**

Kent Peterson, Chair	Bing Liu
Don Colliver, Vice-Chair	Clay Nesler
Blake Ellis	Stet Sanborn
Luke Leung	Ginger Scoggins

MOTIONS REQUIRING APPROVAL:

None.

Information Items

TFBD is providing a mid-year update on the actions assigned.

1. Facilitate and oversee the work of TExCom subcommittees to ensure decarbonization goals are accomplished within the established timeframe.

The ExCom has been working with the Operations Subcommittee and Products and Services Subcommittee to develop guides, update the website, and develop training/education and certification material. There were some delays in getting the new guide working groups started. The following is an update on the status of projects:

Technical Guides

- A. **Building Performance Standards:** A Technical Resource Guide – **is available for free download now!**
- B. **Grid Interactive Buildings for Decarbonization:** Design and Operation Resource Guide - The 60% draft is due to the working group during the Winter Conference and is on target for publication by August 2023.
- C. **Building Decarbonization Retrofits for Commercial and Multifamily Buildings:** Five bids have been received, and the working group is currently reviewing them and will be awarding the contract in early February 2023. The project is on target for publication in May 2024.
- D. **Heat Pump Application, Design, and Operation Guide:** This project is currently out for bid, with the contract selection to occur in February 2023, and is on target for final publication in June 2024.
- E. **Whole Life Carbon Guide for Building Systems:** The working group is developing this guide with a target publication date of October 2023. The work statement is final.
- F. **TM65 for North America:** This project is targeted for publication in August 2023. Final details are still being worked on with CIBSE. The work statement is final.
- G. **Decarbonizing Hospital Buildings:** This project is being co-developed with ASHE and is currently out for bid, with bids due February 20, 2023. The target publication date is March 2024.

Website and Social Media Outreach

- A. The website was revamped with new materials and went live on 2/1/2023. This included updated graphics, the BPS Technical Guide, and video content for the public. Content will be updated regularly.
- B. ASHRAE decarbonization social media video format has been developed to begin the campaign “*Join us on the journey to zero!*”



Website and Social Media Outreach

- A. The Certification Committee has done an initial gap analysis so that the decarbonization certification could be developed.
- B. A Decarb 101 course has been created. The first module of the training is on the website. The TExCom will train grassroots leaders to present this material at chapter meetings after the Winter Conference.
- C. As the guide schedule is finalized, the Training and Education Subcommittee will develop training to follow the guides. In addition, TExCom is developing outlines for additional training materials in the 101 series for the Training and Education Subcommittee to oversee final development.

2. Coordinate TFBD work with ASHRAE Councils, Committees and Task Forces to align goals and eliminate bottlenecks.

TExCom has been working with multiple committees within ASHRAE to reduce bottlenecks and to align the goals. For example:

- A. Worked with the Standards Committee as it incorporates carbon into its strategic and operational plans. We have also issued building decarbonization terminology that was assigned to us by the Standards Committee Decarbonization Ad Hoc. These terms will be on the TFBD website and incorporated into the ASHRAE Terminology database.
- B. TExCom has collaborated with SSPC 90.1 leadership to develop a zero energy code jurisdictional option that can be adopted by state and local governments to meet their climate goals and needs. Standard 90.1 committee also sets the direction for 90.1 to target net zero energy by 2031. We also continue working with them to allow carbon as a metric.
- C. TExCom has collaborated with SSPC 90.2 in revising its work plan. They have set the following goals in their latest work plan:
 - Moving at least halfway toward zero energy in the 2023 publication
 - Creating standards for zero energy and zero carbon as an informative Appendix for the 2023 publication
 - Incorporating the informative Appendix from the 2023 publication into the normative requirements to develop a fully zero energy and carbon standard by 2025
- D. Collaborated with SSPC 100 as it becomes a building performance standard to address both energy and GHG emission reductions for existing buildings.
- E. Collaborated with prior members of 211 to develop an informative appendix to add carbon audits to the standard.
- F. Reviewed and edited starting draft document for Proposed ASHRAE/ICC Standard 240P - *Evaluating Greenhouse Gas (GHG) and Carbon Emissions in Building Design, Construction and Operation*
- G. Collaborated with GAC and approved new PPIB on Building Electrification

3. Coordinate joint building decarbonization initiatives with other organizations deemed beneficial to ASHRAE's building decarbonization work.

- A. TExCom has been coordinating with the following organizations:

• Department of Energy	• ULI
• Environmental Protection Agency	• CIBSE
• AiCARR	• USGBC
• AIA	• BOMA
	• IFMA
- B. TExCom has been coordinating with DOE/LBNL on their development of a GHG Emissions Reduction Audit Checklist for Owners to ensure this work and our draft Standard 211 Informative Appendix requirements are complimentary on the subject.



- C. TExCom has started work with ULI on *Implementing Heat Pumps in Commercial Real Estate: A Myth-Buster*. The audience is Developers, asset managers, owners, property managers, architects, and engineers with beginner/intermediate exposure to sustainability/net zero initiatives. ASHRAE will receive credit as a key collaborator.

4. Expedite the delivery of technical resources that help design engineers deliver and operate low-carbon buildings.

The TFBD has two outreach groups that will provide insight into the needs of the industry.

- A. **The Global Advisory Panel** – this group met with international representatives at the Athens Decarbonization conference and will meet again at the Atlanta Winter Conference. These are the industry leaders from other organizations coming together to provide feedback on the needs and hurdles of the industry. The information gathered will help the TFBD guide the development of additional products and resources.
- B. **Building Industry Decarbonization Collaborative** – Representatives from AIA, BOMA, IFMA, USGBC and ULI have been meeting to develop shared areas where the group can work together to accelerate decarbonization across the building industry. Once the plans are finalized, the group will formally announce the collaborative.

5. Project and publicize ASHRAE’s decarbonization work globally to establish ASHRAE’s leadership position, in partnership with the Society marketing team.

TExCom and the Website/Knowledge Hub Working Group have worked closely with the marketing team to rebrand the ASHRAE TFBD website providing technical resources to help design engineers deliver and operate low-carbon buildings. Updated content will continue to be developed and added each month. Due to our volunteer and marketing team efforts, TExCom has yet to spend ASHRAE funds on this effort.

6. Develop the Society year 2022-2023 budget for decarbonization projects.

This is complete. The board of Directors approved the budget through 2025. TExCom has been able to reduce its spending by partnering with other organizations. The Building Performance Standards: A Technical Resource Guide was co-developed with the Department of Energy, and the budgeted funds were not used. ASHRAE is now partnering with ASHE to develop the Decarbonizing Hospital Buildings Guide, which will reduce the amount of ASHRAE’s financial impact on its development. TExCom is continuing to do outreach to other organizations to develop other guides.

7. Coordinate with and assist the Planning Committee to incorporate ASHRAE’s decarbonization goals into the Society’s Strategic Plan.

TExCom has submitted proposed building decarbonization initiative to the Planning Committee Ad Hoc to update the current Society strategic plan. This includes decarbonization goals consistent with the recommendations in the Position Document.

8. Provide a comprehensive plan for integrating TFBD work into the ASHRAE structure. This plan would include recommendations for any changes required to the ASHRAE structure and streamlining current processes for speed and efficiency.

This action item will be discussed after the Winter Meeting. A plan will be submitted for consideration before the appointments for the 2023-2024 Society year.

Respectfully Submitted,

Kent Peterson, PE, FASHRAE
TFBD Chair



ASHRAE Brand Recognition Ad hoc January 2023

Chair: Kishor Khankari

Goals

- Be recognized as the single most reputable and reliable resource for issues related to the HVAC and R industry by the general public and/or agencies in the built environment.
- Brand recognition should be utilized to promote ASHRAE's membership and products and services during the course of listening to the market.



Membership

F	Industry Classification	
	Consulting Engineer	17,878
	Contractors	4,709
	Manufacturers	4,560
	Student	4,348
	Manufacturer's Rep	3,499
	Gov't, Health, Education	3,359
	Other	3,110
	Design Build	2,849
	Architectural/AE	2,792
	Sales Engineer	838
	Commercial Facility	755
	Property Manager	733
	Industrial Facility	731
	Distributor	579
	Association	500
	Utility	464
	Educational Institution	33
	Research Institution	12
	Library	8
	TOTAL	51,757

High Level Influencers

Owners

Architects

Facility Managers

Contractors

Etc.



Activities

- ❑ Arranged ASHRAE President Interview with the press. Attempted to reach out to wider audience beyond just HVAC&R press. (See attachment)
- ❑ Exploring a possibility of ASHRAE President Interview with the local press in Pakistan.
- ❑ Exploring a possibility of branding ASHRAE method of test.
- ❑ Assessed the current level of efforts in raising ASHRAE profile. (See attachment)
 - ❑ Need for assessing the impact of these activities
 - ❑ Members-staff coordination for marketing activities
- ❑ Exploring a possibility of developing ASHRAE Brand Ambassadors program.



What is next?

- Identify clear actions internal and external to ASHRAE required to address the goals and how each recommendation addresses the goals.
- Recommend structural or process changes needed in our marketing efforts to enhance ASHRAE's brand recognition. Each change to be justified.
- Evaluate if additional resources are required in terms of HR and financing or professional branding consultants.
- Identify potential consultants for possible consideration.
- Implementation timeline.

There may not be enough time to meet these deliverables.



Brand Recognition Ad Hoc Action Item 5: Will provide a list of initiatives for their corresponding departments that focus on projects that relate to brand recognition outside of the normal day to day outreach. An example is Government Outreach Days reaching elected officials (Alice), and TFBD (Vanita).

Marketing/PubEd/Technology

Task Force for Building Decarbonization:

Communication plan forthcoming with launch of new website planned for 2/1/23.

Marketing/PubEd

NYSERDA: Webinars to various expanded audiences ongoing 2021 to present.

Marketing/PubEd

UNEP: Collaboration with the United Nations Environment Programme via [ASHRAE-UNEP OzonAction Work Plan 2021-2023](#) Includes promotions, press release and website updates.

Marketing/PubEd

Lucy's Engineering Adventure

The book has enabled wider distribution to the K-12 audience in schools and HOUSEHOLDS through grassroots efforts in the chapters like East TN and various company support.

Marketing

Mainstream News Reach

Staff coordinates with media and volunteers for mainstream and industry outlet news articles such as [Designing Buildings that are Both Well Ventilated and Green](#), from the Harvard Business Review 1/9/23 to reach beyond our daily audience.

Another example: **Standard 240p Press Release on Pathogen Mitigation** was picked up 15 times in the media. AIHA – [ASHRAE to Develop IAQ Pathogen Mitigation Standard](#)

HPAC – [ASHRAE Developing IAQ Pathogen Mitigation Standard](#)

Green Builder Media – [IAQ Pathogen Mitigation Standard In the Works](#)

FacilitiesNET – [ASHRAE to Develop IAQ Pathogen Mitigation Standard](#)

Plumbing + HVAC – [ASHRAE to Develop IAQ Pathogen Mitigation Standard](#)

eJarn – [ASHRAE Commits to Developing an IAQ Pathogen Mitigation Standard](#)

WTI Pure Air Control Service – [New ASHRAE Pathogen Initiative](#)

ASPE Pipeline – [ASHRAE Commits to Developing an IAQ Pathogen Mitigation Standard](#)

Colorado School of Public Health - [The COVID-19 Pandemic & More: Time to assess lessons learned, and to implement science-based measures to reduce airborne transmission](#)

ACHR News – [ASHRAE Commits to Developing an IAQ Pathogen Mitigation Standard](#)

Mechanical Business – [ASHRAE to Develop IAQ Pathogen Standard](#)

Facility Management News – [ASHRAE Commits to Fast-Tracked IAQ Pathogen Mitigation Standard](#)

Retrofit Magazine – [ASHRAE Support National IAQ Pathogen Mitigation Standard](#)

Medical Construction and Design – [ASHRAE Commits to Developing IAQ Pathogen Mitigation Standard](#)

Harvard Business Review – [Design Buildings That Are Both Well Ventilated and Green](#)

To find more mainstream news: A quick Google search of “ASHRAE” filtered by ‘news’ results, (include media outlet if you’re looking for a specific source) provides a list of articles where ASHRAE is mentioned. For instance “[ASHRAE CNN](#)” in the ‘news’ section of google will show how often the ASHRAE name is mentioned in wide-spread, mainstream news from CNN.

Social Ads

Social media ads targeted to industry professionals beyond our database promoting the Society and products. A Society membership push in October and November of 2022 reached 258,599 and generated 1,756 clicks to ashrae.org.

Government Affairs

Government Outreach Events (GOEs)

GOEs make ASHRAE’s name known to a wide variety of elected officials, policy makers, and regulatory staff:

- Local jurisdictions such as School Boards and city code officials
- State Legislative bodies – outreach is generally done over the course of a full-day with multiple meetings with elected officials and their staff
- State agencies, including state energy offices
- Members of Congress at both the U.S. House of Representatives and U.S. Senate
- Federal Government officials and policy makers
- International entities (e.g., the Canadian House of Commons, India Energy Minister)

Briefings to Government Officials

Briefings are provided to government officials on a particular topic for a specific reason. These are not “outreach events” in that they are not grassroots-led efforts but rather focused on providing technical expertise from various TCs, SSPCs, and other technical entities within ASHRAE. Some examples follow:

- White House Office of Science and Technology Policy: multiple briefings by ETF Chair Bill Bahnfleth on IAQ and pathogen mitigation
- U.S. Trade and Development Agency Workshop to the Philippines on the cold chair (Doug Reindl)
- U.S. Department of Commerce presentation to a 20-person delegation from Eurasia on Refrigeration (Dustin Lilya)
- Technical assistance to Argentina, Chile, Egypt, Indonesia, Nigeria, and Ukraine through the U.S. Department of Energy’s Net Zero World Initiative to Accelerate Energy System Decarbonization

Participation in Government Forums

Government Affairs assists with presentations at various government forums, including the United Nations Conference of the Parties (climate change), Global Clean Energy Action Forum, National Healthy Schools Summit, and NASEO’s Policy Conference. Having an ASHRAE presence at these events is critical to boosting our profile.

Celebration of “Days”

The GAC works with grassroots members to get the word out to elected officials and others about various celebratory “days” such as Energy Efficiency Day, Engineers Week, Building Safety Month, Women in Engineering Day, World Refrigeration Day, and High-Performance Buildings Week. This outreach to the elected official makes ASHRAE’s name known across multiple audiences (government and the public) as a technical authority that also cares about broader policy issues.

Outreach to Peer Organizations

Government Affairs works closely with several aligned organizations (e.g., AIA, BOMA, IFMA, USGBC, ICC, NIBS, NEMA, HPBC, BRAC, EESG, NASEO, AHRI) to strategize on advocacy activities, partner in outreach (through written materials or meetings/briefings) and boost the profile of the buildings industry. While ASHRAE wants its name to be well-known, having the buildings industry voice united can generate increased attention, and people who may have only known about say the AIA, will have an opportunity to also learn about ASHRAE. There is power in numbers.

Outreach through Innovative Partnerships

Government Affairs is also building new partnerships such as U.S. Department of Energy’s Schools Partnership Pilot program, whereby ASHRAE Society, through a volunteer-led leadership team is working with chapters across the nation to reach out to schools and local educational authorities. The purpose of this program is to disseminate information to schools about the various funding opportunities provided by the Federal government (including \$500 million provided in the Infrastructure Law) to improve energy efficiency and IAQ of school facilities. Outreach to schools provides ASHRAE exposure to an audience it doesn’t generally work with: education officials, as well as teachers and students, which could also inspire students to more STEM education and pursue engineering careers.

NOTE: The press coffee invitation was sent to 620 reporters – this includes the AHR list, which is comprised of industry media and top mainstream media outlets such as Bloomberg News, The Washington Post and CNN. The invitation will be resent to our media list each week until the beginning on the conference and calls will be made to local press starting on January 30.



You are invited to join **2022-23 ASHRAE President Farooq Mehboob** for a **Press Coffee** and a discussion on current industry hot topics and his Society theme:

“Securing Our Future”

**Monday, February 6, 2023
9:00-9:50 a.m.**

Georgia World Congress Center

Press Room – B203
285 Andrew Young Intl Blvd NW, Atlanta, Georgia

[Add the Press Coffee to Your Calendar](#)

ASHRAE is also pleased to offer you a *complimentary press registration** to attend the 2023 ASHRAE Winter Conference and AHR Expo.

**Advanced registration is required. See details below.*

2023 ASHRAE Winter Conference

February 4-8, 2023
Atlanta, Georgia

AHR Expo

February 6-8, 2023
Georgia World Congress Center
Atlanta, Georgia

[View Schedule](#)

REPORT TO THE BOARD OF DIRECTORS
From the ASHRAE Headquarters Building Committee
As of January 20, 2023

Recommendations for Board Approval:

1. MOTION: None

- BACKGROUND:

- FISCAL IMPACT

Information Items:

The Committee was continued this year to oversee the correction of several operational issues and to develop a strategy to enhance the building operations to provide a quality indoor environment while effectively using energy. So far this year we have worked on the following issues:

1. The amount of solar power installed at the Headquarters was limited to 250 kW AC due to net metering regulations from Georgia Power, requiring models to be nearly perfect to obtain NZE. Performance is close, but larger DOAS units than what is in the model are a factor. As we continue to learn more as we operate the building, we will continue to adjust the operations. One area is the lighting system, which is not currently controlled by the BAS system.
2. An IAQ monitoring system has been donated by Automated Logic and should be installed soon.
3. Fans installed in Director offices.
4. Digital sound processor installed in Large Gowan training center room to improve digital performance.
5. Rate analysis conducted by Creative Solar, but no better rate options available.
6. New Proposal from Copper Tree, LBNL, DOE to demonstrate Automated System Optimization
7. Cisco intelligent building initiative, currently evaluating the Building Intelligence using the Building Intelligence Quotient (BiQ)
8. DC Microgrid System – Retroactively getting it permitted.

Continue to give many tours. Member reaction to the building is very positive. 3 tours during the Winter conference are sold out. 35 people each.

January 20th, 2023,
Date

Darryl K Boyce
Chair

REPORT TO THE BOARD OF DIRECTORS

from the

Efficient and Healthy Schools Program Partnership with DOE

January 26, 2023

John Constantinide- Chair
Bruce Lindsay

Sonya Pouncy
Chris Ruch

Raj Setty
Jonathan Smith

Recommendations for Board Approval

The Leadership Team of the Efficient and Healthy Schools Program Partnership with DOE (the “ASHRAE-DOE Schools Leadership Team”) has no motions to come before the Board.

Information Items

Since the Chair of the Efficient and Healthy Schools Program Partnership with DOE was appointed by President Mehboob on November 1, 2022, it has met five times and has accomplished many of the responsibilities outlined in the appointment letter:

1. The Chair identified five additional members to assist with managing the project; this group is known as the “ASHRAE-DOE Schools Leadership Team”.
2. Sent invitation letters to 26 chapters to join the pilot project; the chapters were selected based on recommendations from DRCs, and members of the ASHRAE-DOE Schools Leadership Team.
3. Structured a framework for Chapters to use to implement the pilot program in their communities. This framework will continue to be developed further.
4. Finalized the program workplan with DOE and LBNL (see Attachment)
5. Secured commitments from 12 chapters to participate in this pilot partnership program. ...
 - Idaho Chapter
 - Twin Tiers Chapter
 - Fort Worth Chapter
 - Northwest Arkansas
 - Baltimore Chapter
 - New York Chapter
 - Central New York Chapter

- Rochester
 - Southern California Chapter
 - Detroit Chapter
 - Miami Chapter
 - Gold Coast Chapter
6. Held an informational webinar with the selected chapters on what opportunities this partnership presents, specifically the DE-FOA-0002756: RENEW AMERICA'S SCHOOLS (\$500 million total through the Bipartisan Infrastructure Law), and the American Rescue Plan Elementary and Secondary School Emergency Relief (ESSER) Funds.
7. Challenges and Opportunities: In moving this program forward, the leadership team received feedback that it would be useful to get more information on federal funding opportunities. This issue was discussed with the GAC staff liaison, who noted that such information is provided through multiple avenues (listed below), but that an improved dissemination strategy may be needed. This opportunity will be explored further by the ASHRAE-DOE Schools Leadership Team and the GAC.
- Bi-weekly Government Affairs Updates
 - Fact Sheets on funding opportunities assembled by staff and disseminated to the GAC
 - Emails sent to the GAC

Schools Partnership Proposal - ASHRAE, DOE/LBNL

Overarching Program Goals:

- To help schools, including underserved schools (*see below*) access expertise, tools, resources and funding to improve their facilities. Improvements will result in energy cost savings, greenhouse gas (GHG) reductions and improved indoor air and environmental quality (IAQ/IEQ) to support a healthier learning environment.

Outreach and assistance to underserved schools

Each ASHRAE Chapter involved in the Pilot Program is requested to conduct outreach and provide technical assistance to schools, the majority of which as feasible meet two or more of these indicators:

- a) Part of a Disadvantaged Community (DAC)
- b) Title 1 (school-wide program)
- c) 70% or more of students eligible for free and reduced-price lunch
- d) Rural location (coded as 41, 42 or 43)

These schools can be identified by using the DOE's Energy Justice Mapping Tool for Schools - <https://energyjustice-schools.egs.anl.gov/>. Note that additional information (e.g. rural code, Title I) on a given school is provided in the map once that individual school is selected. We request that per participating ASHRAE chapter involved in the Pilot Program, on average each chapter work with at least two rural schools; individual pilot chapter's outreach to rural schools will depend upon the geography of the chapter.

Benefits to ASHRAE Chapters/Members include but are not limited to:

- Elevates ASHRAE's efforts as an organization that assists underserved communities.
- Affords opportunities for ASHRAE Chapters and Members to be recognized for their contributions (e.g., chapter awards, and/or Presidential Award of Excellence (PAOE) Points in certain categories, local community recognition).
- Increases ASHRAE membership awareness and use of available resources.
- Provides opportunities for ASHRAE Chapters, as well as ASHRAE Student Branches, to engage with their local K-12 schools and work together.
- Provides learning and mentoring opportunities for ASHRAE Student Members.
- Educates ASHRAE Members about new funding opportunities, which may be of particular interest to those serving commercial and institutional as well as education sectors.
- ASHRAE design professionals may be part of the design implementation of the various projects after they are generated from the various grantees. By helping structure the design, the transition to actual construction documents will be easier.
- Provides students and teachers in these schools with more exposure to the STEM environment.

US Department of Energy (DOE)/ Lawrence Berkeley National Laboratory (LBNL) value proposition:

- Connects underserved schools with local stakeholders who can serve as a resource, and who can conduct key activities necessary to enable retrofit projects.
- Provides support especially to under-resourced schools and school districts.
- Elevates awareness of the campaign and expands outreach to underserved areas.
- Provides hands-on learning experiences for ASHRAE Student Branches, and other students studying building sciences as a way to promote workforce training.
- Promotes STEM education and workforce development by offering students exposure to the roles of energy managers and facilities staff at local and state education agencies as a potential career path.

Pilot Program: ASHRAE has approximately 120 chapters in the U.S. Rather than rolling this program out to all of these chapters initially, we recommend piloting this program with 10-20 pre-qualified chapters expressing interest and having capability and availability. The lessons learned from the Pilot Program would then be used to improve the partnership, and the program could be rolled out to additional chapters. The broadening of the program could coincide with successive iterations of DOE released funding opportunities for schools.

The following three activities outline the main avenues of proposed engagement between DOE/LBNL and ASHRAE:

Activity 1 relates to general outreach efforts to educate and mobilize ASHRAE Chapters.

Activity 2 involves direct or targeted outreach to underserved schools.

Activity 3 involves providing assistance to schools/districts. There are two ways schools/districts may ask for assistance from ASHRAE:

- a. Via DOE/LBNL outreach efforts, which may then be directed to ASHRAE staff for connection to appropriate Chapter members for support.
- b. ASHRAE Chapter/member direct outreach efforts made with schools and school districts.

Activity 1 - General Outreach and Promotion to ASHRAE Chapters

Goal - To educate ASHRAE Chapters and Members about opportunities to assist schools in energy efficiency (EE) and IAQ retrofits, including funding and financing approaches, and encourage them to engage their local underserved schools, partnering with student chapters when possible.

Activity	DOE/LBNL	ASHRAE
Chapter Education and Outreach	Share announcements, webinars, funding opportunities and resources with ASHRAE and other stakeholders.	Outreach campaign to ASHRAE Members to help mobilize, educate, and promote involvement in underserved schools.

Activity	DOE/LBNL	ASHRAE
	<p>Develop targeted value propositions and messaging specifically to reach these underserved schools.</p> <p>Provide recognition opportunities through the DOE Efficient and Healthy Schools Campaign, and value proposition for schools.</p>	<p>Provide information through ASHRAE’s established communication channels (e.g., <i>Chapter Notes, Student Newsletter</i>) to engage local chapters and student chapters. Promote connections to and mentorship of ASHRAE Student Branches, training the future workforce.</p> <p>Provide opportunities to achieve ASHRAE presidential objectives, including local government engagement and receive recognition of ASHRAE Chapters in both ASHRAE Society and their local community.</p>
<p>Coordinated communications, leveraging synergistic events, training webinars, networking activities.</p> <p>Potential for co-branded webinars with participation from state and local education agencies, EPA, public health agencies, and other stakeholders.</p>		
Resource Promotion	<p>Promote specific tools, resources, e.g.:</p> <ul style="list-style-type: none"> - Studies on benefits of IEQ in learning environment - Example packages of retrofit technologies with energy, health and safety benefits - Building assessment and audit tools - Better Building resources for K-12: lighting, Roof Top Units (RTU), envelope, Energy Management Information System (EMIS) <p>Resources found on the DOE webpage here</p>	<p>Promote specific tools, resources, e.g.:</p> <ul style="list-style-type: none"> - Advanced Energy Design Guides (AEDG) - Building EQ Portal - Level 1 and 2 audits - IAQ and HVAC retrofit guides (e.g. <i>ASHRAE TC 9.7 Design Guidance for Education Facilities: Prioritization for Advanced IAQ</i>)
<p>Opportunities for both organizations to gain greater use of resources currently available, and receive feedback on additional resource needs.</p>		

Activity 2 - Targeted Outreach to Specific Underserved Schools: Pilot Program

Goal: To connect with under-resourced schools and promote the value proposition for EE/IAQ retrofits, various incentives and funding opportunities, avenues for recognition, and establish interest in collaboration.

Process	DOE/LBNL	ASHRAE
Outreach	<p>Provides resources to enable ASHRAE members to identify rural, Title 1, and other under-resourced schools through DOE's Energy Justice Mapping Tool for Schools https://energyjustice-schools.egs.anl.gov/</p> <p>LBNL provides guidance on messaging for this community, including value proposition.</p>	<p>Specific ASHRAE Chapters would be identified for this pilot program, which would in turn identify interested member(s), coordinate with ASHRAE Headquarters (HQ), and work with local student branches as applicable.</p> <p>ASHRAE Member(s) connect with school district in their local areas to promote and offer technical assistance. ASHRAE Member involvement should not preclude any person, whether an ASHRAE Member or not, from participating on a proposal team for a DOE grant application.</p>

Activity 3 – Technical Assistance to Specific Underserved Schools: Pilot Program

Goal: To provide under-resourced schools with basic technical assistance to complete key activities (e.g., audit/needs assessment) necessary to enable retrofit projects.

Process	DOE/LBNL	ASHRAE
Audit / Needs assessment	<p>Provides resources, guidance on requirements of needs assessment for funding opportunities.</p>	<p>Local ASHRAE Member(s) complete benchmarking and Standard 211-compliant Level 1 Energy Audits using Building EQ or other assessment tools.</p> <p>ASHRAE Building EQ team made of ASHRAE Members provides supporting training and guidance as needed.</p> <p>Workplan development</p>
Follow-up technical assistance potential	<p>Resources on retrofit approaches, EE/IEQ best practices, funding, and financing availability</p>	<p>Share ideas and recommendations for improving school facilities, which would provide the most value-add for energy efficiency, improved IAQ and other sustainability/resilience</p>

Process	DOE/LBNL	ASHRAE
		<p>improvements.</p> <p>If funding is identified: design implementation of Mechanical, Electrical, and Plumbing (MEP) as well as Commissioning (Cx) and retro/re-commissioning (RCx) solutions</p> <p>Promotion of ASHRAE tools, resources, e.g., AEDGs</p>
Recognition of Achievements	<p>Avenue for recognition through the Efficient and Healthy Schools campaign. https://efficienthealthyschools.lbl.gov/recognition</p>	<p>Presentations at conferences of</p> <ul style="list-style-type: none"> ● ASHRAE ● School Board Officials ● School Facility Managers
	<p>Consider convening an event where teams consisting of schools/districts administration, teachers, parents, students and ASHRAE Chapters can present their work. These events can offer opportunities to recognize outstanding work.</p> <p>Consider participating in, and helping to coordinate an event where schools are recognized for their achievements through the Efficient and Healthy Schools campaign.</p> <p>Have some awards recognition for ASHRAE members who went above and beyond to help with this program. Recognition could be at the chapter, Region, or Society Level.</p>	



2022-23 Committee Appointments & Election Reference

Committees Reporting to Board of Directors

BOD ExO = Ex Officio Board of Directors, CO = Coordinating Officer, DAL = Director-at-Large, RAL = Region-at-Large, Mbr = Member, RMCR = Region Members Council Representative, NVM = Non-voting Member

Audit Committee

Eileen Jensen, Chair
Adrienne Thomle*
Cheng Wee Leong*
Craig Wright, Staff Liaison

Building Energy Quotient

Chris Balbach, Chair
Michael Deru, Vice Chair
Trent Hunt
Mahroo Eftekhari
Rupesh Iyengar*
Supriya Goel*
Jaideep Karnick*
Doug Cochrane*
Charles Eley, Consultant
Sarah Maston, CO*
Lilas Pratt, Staff Liaison

Development Committee

Tiffany Bates Abruzzo , Chair
Bill McQuade, Vice Chair
Mike Beda, Life Members Club
Janice Means, Scholarship Trustee*
Dave Branson, College of Fellows
Matt Rowe, RP ExCom
Aakash Patel, RP ExCom
Lester Periera, RP ExCom *
Tom Watson, Foundation ExCom
Don Colliver, Foundation ExCom
Bill Harrison, Foundation ExCom
Dacrcy Carbone, Member-at-Large*
Bogi Setty, Member-at-Large
Pankaj Dharkar, Member-at-Large*
Billy Austin, CO*
Kim Mitchell, Chief Development Officer

Finance Committee

Dennis Knight*
Doug Cochrane
Michael Cooper
Bill Dean
Dunstan Macauley, VP*
Sarah Maston, VP*
Ahmed Alaa Eldin Mohamed
Don Brandt*
Craig Wright, Staff Liaison

Planning Committee

Heather Platt Gulledge, Chair
Stephanie Kunkel, Vice Chair
Farhan Mehboob*
Jake Kopocis*
Michael Patton*
Chad Smith*
Ahmed Alaa Eldin Mohamed
Blake Ellis
Wade Conlan
Andres Sepulveda
Trent Hunt
Mark Miller
Dunstan Macauley, CO*
Jeff Littleton, NVM, EVP
Kim Mitchell, Staff Director*
Chandrias Jolly, Staff Liaison

Society Rules Committee

Ken Cooper, Chair
Ronald Gagnon , Vice Chair
Spencer Morasch *
Mike Bilderbeck
Bert Philips
Adrienne Thomle
Ashish Rakheja, CO*
Chandrias Jolly, Staff Liaison

*** = New Member**

Note: Appointments determined to be in conflict with applicable Rules of the Board for membership qualifications or committee composition are subject to change unless appropriate waivers of the rules are obtained.

Committees Reporting to Members Council

Chapter Technology Transfer Committee

Mohammad Al Tassi, Chair
 Daniel Robert, Vice Chair
 Andrew Reilman, Vice Chair
 Frank Rivera (I)
 Abhishek Khurana(II)*
 Matthew Archey (III)
 Chris Adams (IV)
 Arunabha Sau (V)
 Elizabeth Zakelj (VI)
 Grant Page (VII)
 Ken Shifflett (VIII)
 Abigail Brophy (IX)
 Tyler Bradshaw (X)
 Janice Peterson (XI)
 Thaigo Portes (XII)
 Sivakumar Gadam (XIII)*
 Mahroo Eftekhari (XIV)
 Osama Atef Khayata(RAL)*
 John Constantinide, Chap. Progs. Coord.
 Heric Holmes, Web Broadcast Coord.
 Wei Sun, BOD ExO*
 Ginger Scoggins, CO*
 Rhiannon Masterson, Staff Liaison

Communications Committee

Jessica Mangler, Chair
 Anuj Gupta, Vice Chair
 Nissun Feiner*
 Kinga Hydras*
 Eleazar Rivera
 Thursten Simonsen
 Nikolaos Spiridonos Giannitsanos
 Daniel Bourque
 Devin Abellon, BOD ExO*
 Ginger Scoggins, CO*
 Joslyn Ratcliffe, Staff Liaison

Conferences & Expositions Committee

Christine Reinders – Caron, Chair
 Raul Simonetti, Vice Chair
 Gary Debes
 James Liston*
 NG Yong Kong*
 Ehab Mamdouh*
 Aaron Boranian*
 Joe Chow*
 Atilla Biyikoglu*
 Craig Bradshaw*
 Ahmed Abdel Salam
 Nohad Boudani
 Marites Calad
 Kristen Cetin
 Brian Fronk
 Lina Hashem
 Alekhya Kaianathbhatta
 Rafi Karim
 Suzanne LeViseur
 Maggie Moninski
 Scott Peach
 Anoop Peediyakkan
 Elbert Phillips
 Erik Sanchez
 Som Shrestha
 Davide Ziviani
 Devin Abellon, BOD ExO*
 Ginger Scoggins, CO *
 Tony Giometti, Staff Liaison

Government Affairs Committee

Darryl Boyce, Chair
 Robert Hoadley, Vice Chair
 Basel Anbari, Members Council Rep.*
 Cindy Callaway, PubEd Council Rep.*
 Chris Phelan, Tech Council Rep.*
 Nanette Lockwood, Member-at-Large
 Meghan McNulty, Member-at-Large
 Mike Wolf, Member-at-Large
 Thomas Reyes (I)
 Mike Genin (II)
 RJ Hartman (III)
 Weston Hockaday (IV)*
 Louis Van Belle (V)
 Beth Tomlinson (VI)
 Jess Gardner (VII)
 Damon McClure (VIII)

Honors and Awards Committee

Isabelle Lavoie, Chair
 Maged Hashem*
 Mohammad Tassi*
 Karine Leblanc*
 Dan Rogers
 Alyse Falcolner
 Tom Phoenix
 Ben Leppard
 Mohammed Abass Sajid
 Adam Davis
 Wei Sun, BOD ExO*
 Ginger Scoggins, CO*
 Rhiannon Masterson, Staff Liaison

Membership Promotion Committee

Genevieve Lussier, Chair
 Daniel Chudecke, Vice Chair
 Jason Urso, Vice Chair
 Chonghui Liu (I)*
 Frank Mesciek (II)*
 Rob Druga (III)
 Timothy G. Cannon (IV)
 Jake Taylor (V)*
 Fiona Martin (VI)
 Steve Grant (VII)
 Ron McCarty (VIII)*
 Mark Penchoff (IX)*
 Nicolas Rosner (X)
 TBD (XI)*
 Esteban Baccini (XII)
 Sam C.M. Hui (XIII)

*** = New Member**

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Government Affairs Committee
Cont'd

Peter Koneck-Wilwerding (IX)*
~~Ryan Carlson (X)*~~ Tracey Jumper 1/4/23 (X)
 Daryl Glen Collerman (XI)*
 Timothy Theriault (XII)
 Yew T.A. Sin (Albert)(XIII)
 George Pantelidis (XIV)
 Ahmed Bolbol(RAL)*
 Sonya Pouncy, Commun. Coord.
 Ken Fulk, BOD ExO*
 Dennis Knight, CO*
 Alice Yates, Staff Liaison

Membership Promotion Committee Cont'd

Triantafyllos Triantafyllopoulos (XIV)
 Nitin Naik (RAL)
 Eileen Jensen, BOD ExO*
 Ginger Scoggins, CO*
 Daniel Gurley, Staff Liaison

Research Promotion Committee

Matt Rowe, Chair
 Aakash Patel, 1st Vice Chair
 Lester Pereira, 2nd Vice Chair
 Heather Schopplein, 3rd Vice Chair
 Haley Goslinga, 4th Vice Chair
 Andrew E. Manos (I)
 Ibrahim Semhat (II)
 Laura Petrillo-Groh (III)
 Brian Justice (IV)*
 Paul Fernandez (V)
 Haley Goslinga (VI)
 Jennings Davis (VII)*
 Chris Dolan (VIII)
 Dahl Carmichael (IX)
 Kevin Baldwin (X)
 John Farley (XI)
 Javier Korenko(XII)*
 Swei Keong Chea (XIII)
 Daniel Coakley (XIV)
 Adeeba Mehboob (RAL)
 Kishor Khankari, BOD ExO
 Ginger Scoggins, CO*
 Julia Mumford, Staff Liaison

Student Activities Committee

Mai Anh Dao, Chair
 Kellie Huff, Vice Chair
 Ashley Keller (I)*
 Elizabeth Primeau (II)
 Andy Hobson (III)*
 Adam Blake Parker (IV)
 Bob Snow (V)
 Kevin Summers (VI)*
 Nancy McBee (VII)
 Jacky Hay (VIII)*
 Shaun Nienhueser (IX)
 Omar Rojas (X)
 Tracy McKeon (XI)
 Walter Lenzi (XII)
 Fu Jen Wang (XIII)
 Aleksandar Andjelkovic (XIV)
 Yashkumar Shukla (RAL)*
 Dennis O'Neal, Accred. Rep/ABET Board
 Mansour Zenouzi, Accred. Rep/ABET
 EAC
 Robert Bittle, Accred.Rep/ABET ETAC
 Eileen Jensen, BOD, ExO*
 Ginger Scoggins, CO*
 Katie Thomson, Staff Liaison

Young Engineers in ASHRAE Committee

Madison Schultz, Chair
 Branislav Cvijetinovic, Senior Vice Chair
 Bruno Martinez, Junior Vice Chair
 Elizabeth Jedrlinic (I)
 Alekhya Kaianathbhatta (II)
 Carrie Anne Monplaisir (III)
 Kimberly Pierson (IV)
 Paul Fernandez (V)*
 Drew Samuels (VI)*
 Robert Hangen (VII)
 Marisa Kamstra (VIII)
 Marie VanderVliet (IX)*
 Elise Kiland (X)
 Cailin MacPherson (Noll) (XI)
 Kieron Nanan (XII)*
 Chak Mou Lam (XIII)*
 Joshua Vasudevan (XIV)*
 Eman Mamdouh (RAL)
 Menatella Mohamad, Member-at-Large *
 Chris Krieps, Member-at-Large
 Kellie Huff, Student Activities Liaison
 Jason Urso, Membership Promotion Liaison
 Ron Gagnon, BOD ExO*
 Ginger Scoggins, CO*
 Jeanette McCray, Staff Liaison

*** = New Member**

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Committees Reporting to Publishing and Education Council

Certification Committee

Kim Cowman, Chair
Nick Armstrong, Vice Chair
Suz Ann Arroyo
Greg Jones*
Vikram Murthy *
Carlos Mitroga*
Keith Reihl*
Apichit Lumertpongpana*
Grant Page
Rodrigo Arias
Badri Patel
Mark Tome, BOD ExO *
Dunstan Macauley, CO *
Tim Kline, Staff Liaison

Historical Committee

Nissun Feiner, Chair
Tom Pollard, Vice Chair
Andy Pearson*
Khalid Gulzar*
Norman Grusnick
Wei Sun
Akinbowale O. Soluade*
Art Giesler, ExO*
Dunstan Macauley, CO *
Julia Harr, Staff Liaison

Training and Education Committee

Jim Vallort, Chair
Jesse Fisher, Vice Chair
Terry Schroeder*
Adeeba Mehboob*
Kozen Law*
Zeeshan Ahmad Siddiqui*
Tim Ashby *
Jim Piscopo*
Ashley Weekly
Tahir Raza
Jason Alfonso
Kimberly Pierson
Dru Crawley, BOD ExO*
Don Brandt, CO*
Karen Murray, Staff Liaison

Publications Committee

Gerardo Alphonso, Chair
Vinay Ananthachar, Vice Chair
Cameron Labunski
Kurt Monteiro*
Jennifer Isenbeck*
Steve Kavanaugh*
Kay Thrasher
Atilla Biyikoglu
Javier Korenko
George Pantelidis
Mohamed Eltaieb Ibrahim*
AlagraaMegan Tosh
Blake Ellis, BOD ExO*
Dunstan Macauley, CO*
Cindy Michaels, Staff Liaison

* = New Member

Committees Reporting to Technology Council

Environmental Health Committee

Nick Clements*
Bill Bahnfleth/ Past STDs*
Brendon Burley
Junjing Yang
Farhad Memarzadeh*
Ken Mead *
Osama Khataya*
Jon Cohen
Clareesa Lucas
Stephanie Taylor
Don Weekes/ Past RAC
Marwa Zaatari/ Past TC Chair
Mark Ereth
Linda Lee
Corey Metzger
Wade Conlan, BOD ExO*
Sarah Maston, CO*
Steve Hammerling, Staff Liaison

Refrigeration Technology Committee for Comfort - Process - Cold Chain

Dustin Lilya, Chair
Steve Kujak, Vice Chair
Doug Scott*
Apichit Lumlertpongpana*
Anish Simha*
Xudong Wang*
Harshal Surange
Ayman Taha Hussein Eltalouny
Didier Coulomb
Roberto Aguilo
Kashif Nawaz
Nicole Dunbar
Wade Conlan*
Wade Conlan, BOD ExO*
Sarah Maston, CO*
Mike Vaughn, Staff Liaison

Residential Buildings Committee

Bill Healy, Chair
Chandra Sekhar, Vice Chair
Mike Pouchak*
Jaap Hogeling*
Yash Kumar Shukla*
Philip Fairey*
Bjarne Olesen
Mark Lawrence
J. Stephen Saunders
Steven Emmerich
Carol Marriott
Rachel Romero
Mike Blanford
Adrienne Thomle, BOD ExO
Sarah Maston, CO*
Lilas Pratt, Staff Liaison

* = New Member

For Information Only Members Elected to Committees

Standards Committee

Susanna Hanson, Chair
Jonathan Humble, Vice Chair
Thomas E. Cappelin (23)
Douglas D. Fick (23)
Srinivas Katipamula (23)
~~Essam Khalil~~ Pat Marks 9/13/22 (23)
Cesar Lim (23)
Bill Bahnfleth(23)
Christian R. Taber (23)
Gerald Kettler (24)
David (Dave) Robin (24)
Jay Kohler (24)
Jim Lutz (24)
Julie Majurin (25)
Larry Markel (25)
Gwelen Paliaga (25)
Justin Prosser (25)
Margaret Mathison(25)
Patricia Graef (25)
Paul Lindahl (25)
William F. Walter (25)
Kathleen Owen (26)*
Jennifer Isenbeck (26)*
Phillip Johnson (26)*
Karl Peterman (26)*
Jaap Hogeling (26)*
Chris Seeton (26)*
Paolo M. Tronville (26)*
Steve Sill, BOD ExO
Sarah Maston, CO*
Connor Barbaree, Staff Liaison

Research Administration Committee

Omar Abdelaziz, Chair
Bill Murphy, Vice Chair
Ahmed Kashef (23)
William J. Hutzel (23)
Lorenzo Cremaschi (23)
Chee Sheng Ow (23)
Jin Jin Wen (24)
Stefan Ebel (24)
Natascha Milesi-Ferretti (24)
Roland Charneux (25)
James Bogart (25)
Carl F. Huber (26)
Doug Scott (26)
Dennis R. Landsberg (26)
Hywel Davies, Consultant (23)
Xuding Wang, Consultant (23)
Tyler Glesne, BOD ExO*
Sarah Maston, CO*
Michael Vaughn, Staff Liaison

Technical Activities Committee

Craig Messmer, Chair
James Bennett, Vice Chair
Pat Marks (26)
Vikrant Aute (26)
Tina Brueckner (26)
Birol Kilkis (26)
Charles Henck (23)
Jon J. Cohen (23)
Kevin B Mercer (23)
Brad Cochran (24)
Satheesh Kulankara (24)
Kevin Marple (24)
Douglas Reindl (25)
David Meredith (25)
Daniel Dettmers (25)
Corey Metzger (25)
Luke Leung, BOD ExO
Sarah Maston, CO*
Steve Hammerling, Staff Liaison

* = New Member

For Information Only

Members Elected to Committees (Continued)

Handbook Committee

David Scott Fisher, Chair
Harris Sheinman, Vice Chair

Subcommittee for 2023 HVAC Applications Handbook

Harris Sheinman, SubC. Chair
Eric W. Adams
Brian C. Krafthefer
Gusaran D. Mathur
Kashif Nawaz
Joseph Sanders

Subcommittee for 2024 HVAC Systems and Equipment Volume Handbook

Joseph Furman, SubC. Chair
Derek Crowe
Nicolas Lemire
Ahmed A. Medhat
Satish Iyengar
Chee Sheng Ow

Subcommittee for 2025 Fundamentals Handbook

Stephanie Mages, SubC. Chair
Sonya Pouncy
Caroline Calloway
Frederich Granzow
Marija Todorovic*
Jeff Boldt

Subcommittee for 2026 Refrigeration Handbook

Adrienne Thomle, SubC. Chair*
Drake Erbe*
Kevin Muldoon*
Cameron Labunski*
Vance Payne*
Zheng O'Neill*

Chris Gray, BOD ExO*
Dunstan Macauley, CO*
Heather Kennedy, Staff Liaison

*** = New Member**

For Information Only Members Elected / Appointed to Councils

Members Council

Ginger Scoggins, Chair, President-Elect
Dennis Knight, Vice Chair, Treasurer
Devin Abellon, Mbr., Director (23)
Ken Fulk, Mbr., Director (23)
Eileen Jensen , Mbr., Director (23)*
Kishor Khankari , Mbr., Director (23)
Ronald Gagnon, Mbr., Director (23)
Wei Sun , Mbr., Director (23)*
Charles J. Bertuch, III RMCR (I) (24)
Danny Castellan RMCR (II) (24)
Sherry Abbott-Adkins RMCR (III) (24)
Heather Platt Gulledege RMCR (IV)(25)
Julia Timberman RMCR (V) (25)
Maggie Moninski RMCR (VI) (25)
Scott Peach RMCR (VII) (23)
Joseph Sanders RMCR (VIII) (23)
Kevin Amende RMCR (IX) (23)
Burton (Buzz) Wright RMCR (X) (23)
Rob Craddock RMCR (XI) (24)
Tulia Rios RMCR (XII) (25)
Ong Ching Loon RMCR (XIII) (25)
Ioan Siliviu Dobosi RMCR (XIV) (23)
Mohamed Basel Anbari RMCR (RAL) (24)
Joyce Abrams, Staff Liaison

(In addition to the above voting members, this council includes chairs of committees reporting to the council as non-voting members, a Planning Committee liaison, and a Developing Economies consultant.)

Publishing and Education Council

Dunstan Macauley, Chair, Vice President
Billy Austin, Vice Chair, Vice President
Art Giesler, Mbr., Director (23)*
Mark Tome, Mbr., Director (23)
Chris Gray, Mbr., Director (23)*
Blake Ellis, Mbr., Director (23) *
Dru Crawley, Mbr., Director (23)*
Suzanne LeViseur, Mbr., Past Cert. (24)
Cindy Callaway, Mbr., Past Handbook (23) *
Jason Alphonso, Mbr., Past Train. and Educat. (24)
Mark Fly, Mbr., Past Publications (23) *
Mark Owen, Staff Liaison

(In addition to the above, this council includes chairs of Committees reporting to the council as voting members (excluding the Historical Committee Chair) and Vice-Chairs as non-voting members, a Planning Committee liaison, and a Developing Economies consultant.)

Technology Council

Sarah Maston, Chair, Vice President
Ashish Rakheja, Vice Chair, Vice President
Tyler Glesne, Mbr., Director (23)
Wade Conlan, Mbr., Director (23)
Adrienne Thomle Mbr., DAL (23)
Luke Leung, Mbr, DAL (23)
Steve Sill, Mbr, DAL (23)
Paul Francisco, Mbr, Past Standards (24)
David Yashar, Mbr, Past RAC (23)
Costas Balaras, Mbr, Past DRC (25)
Carl Huber, Mbr, Past TAC (25)
Larry Smith, Mbr-at-Large (25)
Chris Phelan, Mbr-at-Large (24)
Wei Sun, Mbr-at-Large, (23)
Stephanie Reiniche, Staff Liaison

(In addition to the above voting members, this council includes chairs and vice chairs of committees reporting to the council as non-voting members, a Planning Committee liaison, and a Developing Economies consultant.)

*** = New Member**

For Information Only
2022-23 Nominating Committee

Chuck Gullede, Chair
Mick Schwedler, Vice Chair

Region Members

I Joseph L. Furman
II Isabelle Lavoie
III ~~Daniel C. Pettway~~ James Grant 10/17/22
IV Jimmy Leonida
V Lee Millies
VI Mark Miller
VII Kay Thrasher
VIII Mark Fly
IX Trent Hunt
X Marites Calad
XI Jeff Hurd
XII Dan Rogers
XIII Dominador G. Castro, Jr.
XIV Eduardo Maldonado
RAL Krishnan Viswanath

Region Alternates

(Selected by Regions)

I Richard E. Vehlow
II Nicolas Lemire
III ~~James Grant~~ Roger K. Jones 10/17/22
IV Chuck Curlin
V Jack Kibort
VI Fiona McCarthy
VII Michael Cooper
VIII Chris Ahne
IX Jonathan Smith
X Robert Kunkel
XI Greg Fluter
XII Eduardo Congos
XIII Han Guan Den Low
XIV Bratislav Blagojevic
RAL Abbass Sajid

Members

Julia Keen-IX
Sheila Hayter – IX
T. David Underwood – II
Karine Leblanc – X
Timothy C. Dwyer – XIV
Bjarne Olesen – XIV
~~Boggarm Setty – III~~ William K. Dean – XI 10/28/22
~~William K. Dean – XI~~ Nohad Boudani - RAL 10/31/22

Alternates

(Elected by BOD)

~~Nohad Boudani – RAL~~ Francis A. Mills – XIV 10/28/22
~~Francis A. Mills – XIV~~ Cesar L. Lim- XIII 10/28/22
~~Cesar L. Lim – XIII~~ Pat Graef – XII 10/28/22
~~Pat Graef – XII~~ John Nix – XII 10/28/22
~~John Nix – XII~~ Jennifer Leach – III 10/28/22
~~Jennifer Leach – III~~ Guy Perreault – II 10/28/22
~~Edward Tsui – XIII~~ Maged Fouad – RAL 10/31/22
~~T. Randall Jones~~ Ade Awujoola – RAL 11/4/22

Candace DeV Vaughn, Staff Liaison

* = New Member



2022-23 Presidential Appointments

Appointments as displayed are for the 2022-2023 Society year and include ASHRAE Representatives, Intersociety Representatives, Coordinating Groups, Liaison Committees, BOD Ad Hocs, and Task Groups.

As of November 1, 2022

***MOU with ASHRAE**

Intersociety/ ASHRAE Reps.		
Group/ Committee Name	Appointees	Appointed Position
AABC / ACG / EMA	Wade Conlan	ASHRAE Representative
American Council of Engineering Companies (ACEC)	Billy Austin	ASHRAE Representative
AIA Liaison Committee	Tim Wentz	Chair
	Dan Nall	Member
	Dennis Knight	Member
	Ginger Scoggins	Member
	Ashish Rakheja	Member
	Lance Davis	Member
	Joyce Abrams	Staff Liaison
AiCARR ASHRAE Group	Farooq Mehboob	President
	Ginger Scoggins	President-Elect
	Dennis Knight	Treasurer
	Jeff Littleton	Executive Vice President
ASE Buildings Subcommittee	Alice Yates	ASHRAE Representative
American Society for Healthcare Engineering (ASHE)	Traci Hanegan	ASHRAE Representative
APPA	Dunstan Macauley	ASHRAE Representative
	Darryl Boyce	Consultant
BOMA	Sarah Maston	ASHRAE Representative
Building Decarb. Conference Rep. (Greece)	Tom Phoenix	ASHRAE Representative
CIBSE/ASHRAE Liaison Subcommittee	Farooq Mehboob	Member
	Ginger Scoggins	Member
	Dennis knight	Member

	Jeff Littleton	Executive Vice President
CIBSE/ASHRAE Workgroup	Tim Wentz	Member
	Sheila Hayter	Member
CIBSE/ASHRAE/REHVA Workgroup	Andres Sepulveda	Chair
	Mick Schwedler	Member
	Dennis Knight	Member
	Ginger Scoggins	Member
	Jeff Littleton	Executive Vice President
Department of Energy's (DOE's) Building Technologies Office (BTO) - Energy Efficiency and Resilience in the Built Environment TAG	Sheila Hayter	ASHRAE Representative
Efficient and Healthy Schools Program Partnership with DOE	John Constantidine	Chair
Facility Guidelines Institute (FGI)	Heather Platt Gulledge	Liaison/ ASHRAE Representative
Global Cold Chain Alliance (GCCA)	Harshal Surange	ASHRAE Representative
IEQ-GA Global Alliance (IEQ)	Corey Metzger	ASHRAE Representative
	TL Chen	Alternate ASHRAE Representative
International District Energy Association (IDEA)	TBD	ASHRAE Representative
International Facility Management (IFMA)	Chris Gray	ASHRAE Representative
International Network for Women in Cooling initiative (INWIC)	Sarah Maston	ASHRAE Representative
	Sheila Hayter	ASHRAE Representative
New Buildings Institute	Mick Schwedler	ASHRAE Representative
National Council of Examiners for Engineering and Surveying (NCEES) - Mechanical Engineering Examination	David Meredith	Exam Writer
National Council of Examiners for Engineering and Surveying (NCEES) - POLC LTW	Doug Fick	ASHRAE Representative
National Council of Examiners for Engineering and Surveying (NCEES) - Architectural Engineering Examination	Tom Lawrence	Item Writer
National Environmental Balancing Bureau (NEBB)	Don Hill	Intersociety Liaison
NIBS BIM Council	Dennis Knight	ASHRAE Representative

NIBS Board Representative	Dennis Knight	ASHRAE Representative
PAHO/ WHO Pan American Health Organization	Tim Wentz	Chair
	Wade Conlan	Member
	Ashish Rakheja	Member
Resource Innovation Institute (RII)	Billy Austin	ASHRAE Representative
Rocky Mountain Institute	Don Brandt	ASHRAE Representative
Technical Advisory Committee of the Clean Cooling Collaborative (KCEF)	Ginger Scoggins	ASHRAE Representative
	Bill McQuade	ASHRAE Representative
UNEP	Tim Wentz	Chair
	Mick Schwedler	Immediate Past President
	Farooq Mehboob	President
	Ginger Scoggins	President Elect
	Ahmed Alaa Eldin Mohamed	Member
	Dunstan Macauley	Member
	Jeff Littleton	Executive Vice President
	Mark Owen	Staff Lead

Ad Hocs and Task Groups

Group/ Committee Name	Appointees	Appointed Position
ASHRAE HQ Ad Hoc	Darryl Boyce	Chair
	Ginger Scoggins	Member
	Don Brandt	Member
	Blake Ellis	Member
	Jayson Bursill	Member
	Manish Sharma	Consultant/ Technical Advisory Group
	Bill MacGowan	Consultant/ Technical Advisory Group
	Jiri Skopek	Consultant / Technical Advisory Group
	Jeff Littleton	Executive Vice President
	Mike Vaughn	Staff
ASHRAE Task Force for Building Decarbonization - ExCom	Kent Peterson	Chair
	Don Colliver	Vice Chair
	Bing Liu	Member
	Luke Leung	Member (Liaison to Tech Council)
	Clay Nesler	Member
	Blake Ellis	Member (Operations SubC Chair and liaison to PubEd Council)
	Stet Sanborn	Member (Products and Services SubC Chair)

	Ginger Scoggins	Liaison to the Board of Directors
Task Force for International Standards	Drake Erbe	Co-Chair
	Steve Bushby	Co-Chair
	Dennis Knight	Member
	Kelly Seeger	Member
	Ashish Rakheja	Member
	Jaap Hogeling	Member
	James Bennett	Member
	Chandra Sekhar	Member
	Jonathan Humble	Member
	Oludare Soluade	Member
	Henry Yeo	Member
	Oswaldo de Siqueira Bueno	Member
	George Pantdelis	Member
	Hesham Safwat	Member
	Farhan Mehboob	Member
	Ryan Shanley	Staff
Stephanie Reiniche	Staff Director	
Champions Club	Tim Wentz	Chair
	Farooq Mehboob	President
	Adrienne Thomle	Member
	Kishor Khankari	Member
	Megan Tosh	Member
	Ginger Scoggins	Member
	Sarah Maston	Member
	Dennis Knight	Member
	Dunstan Macauley	Member
	Hugh Crowther	Member
	Jeff Littleton	EVP
	Chandrias Jolly	Staff
ASHRAE at International Conferences Task Group	Andres Sepulveda	Chair
	Cheng Wee Leong	Member
	Ronald Gagnon	Member
	Art Giesler	Member
	Richie Mittal	Member
	Christine Reinders – Caron	NVM/ CEC Chair
	Tony Giometti	Staff
	Mick Schwedler	Consultant
BOD Subcommittees		
Diversity, Equity, and Inclusion (DEI) BOD Subcommittee	Adrienne Thomle	Chair
	Kishor Khankari	Vice Chair

	Susanna Hanson	Member
	Devin Abellon	Member
	Wei Sun	Member
	Ashish Rakheja	Member
	Billy Austin	Member
	Dennis Knight	Member
Financial Focus Subcommittee	Dennis Knight	Chair
	Art Giesler	Vice Chair
	Cheng Wee Leong	Member
	Bryan Holcomb	Member
	Steve Sill	Member
	Wade Conlan	Member
	Mark Tome	Member
	Hugh Crowther	Consultant
	Craig Wright	Staff Representative
Strategic Business Development Subcommittee	Dunstan Macauley	Chair
	Blake Ellis	Vice Chair
	Ron Gagnon	Member
	Randy Schrecengost	Member
	Ken Fulk	Member
	Luke Leung	Member
	Dru Crawley	Member
	Chris Gray	Member
	Jeff Littleton	Consultant
	Mark Owen	Staff Representative
Society Streamlining Subcommittee	Sarah Maston	Chair
	Andres Sepulveda	Vice Chair
	James Arnold	Member
	John Constantinide	Member
	Eileen Jensen	Member
	Richie Mittal	Member
	Tyler Glesne	Member
	Chris Gray	Member
	Tim Wentz	Consultant
	Kim Mitchell	Staff
ASHRAE Brand Recognition Ad hoc	Kishor Khankari	Chair
	Blake Ellis	Vice Chair
	Ken Fulk	Member
	Karine Leblanc	Member
	Steven Sill	Member
	Adeeba Mehboob	Member
	Vanita Gupta	Member/Staff
	Alice Yates	Member/Staff
	Mark Owen	Member/Staff



MEMORANDUM

DATE: January 17, 2023

TO: Board of Directors
Standards Committee

FROM: Connor Barbaree

SUBJECT: List of potential standards, guidelines, and addenda to be considered during the 2023 ASHRAE Winter Meeting

Attached are analysis sheets for standards, guidelines, and addenda that may be presented to Standards Committee and the Board for publication approval during the upcoming meeting. The analysis sheets are sent in advance of the meeting to provide information in preparation for voting on withdrawal or publication of proposed documents.

If you have a question about the unresolved comments on a publication draft or the attempts to resolve the comments please contact me to view an electronic copy of this documentation, at: cbarbaree@ashrae.org, 678-539-1125.

Please note the following important information regarding the analysis sheets:

- Analysis sheets are included only for those publications having unresolved public review commenters and/or negative PC votes.
- PASA require only those publications with unresolved objectors and/or those where legal action has been threatened to come forward to the Board for approval.
- PASA changes approved by ANSI and the ASHRAE Board of Directors allow documents with no unresolved objectors to be processed by staff for publication and reported to Standards Committee and the Board of Directors. These include the following:
 - a. ANSI/ASHRAE Addendum h to ANSI/ASHRAE Standard 55-2020, *Thermal Environmental Conditions for Human Occupancy*
 - b. ANSI/ASHRAE addendum e, g, and h to ANSI/ASHRAE/ASHE Standard 170-2021, *Ventilation of Health Care Facilities*
- Due to ANSI requirements, only commenter information for the last full public and any subsequent ISC¹ public reviews on the analysis sheets are provided.
- Information regarding comments reflects on-time comments only.
- In compliance with ANSI requirements, the Project Committee (PC) vote states the vote tallies for yes-votes, no-votes, no-votes without comments, abstentions, and unreturned letter ballots. Votes for Standards Committee do not require this information.

¹ ISCs are “independent substantive changes” to a previous public review draft. In an ISC only the marked-up changes are open for comment.



ANALYSIS SHEET

RECOMMENDATION TO BOARD OF DIRECTORS FOR APPROVAL TO PUBLISH PROPOSED STANDARD/GUIDELINE/ADDENDUM

1. Designation: BSR/ASHRAE/IES Addendum c ANSI/ASHRAE/IES Standard 90.2- *High-Performance Energy Design of Residential Buildings*
2. Chair: David Goldstein
3. Cognizant TC: TC 9.6
4. Public Review Dates: 1st Public Review (FULL): February 4, 2022 to March 21, 2022
2nd Public Review (ISC): July 15, 2022 to August 29, 2022
5. Comments Received: 1st Public Review: 29 comments from 17 commenters
2nd Public Review (ISC): 5 comments from 2 commenters
6. Unresolved Comments: 1st Public Review: 6 Unresolved Comments from 3 commenters
2nd Public Review (ISC): 0 Unresolved Comments
7. PC Approval Vote: 14-1-0-1-8
(Yes-No-No without comment-Abstain-Ballot not returned)
8. Total # Unresolved Objectors: 4 – There is 1 unresolved negative voter (Rosenstock) and 3 unresolved commenters (Lord, Petrillo-Groh, Culp)
9. StdC Vote for Approval: TBD (Yes-No-Abstain)
10. Description: This addendum documents the new TPS for 90.2 that was approved by Technology Council in June 2022. Notably, the new TPS allows for higher performance requirements to reduce energy use and greenhouse gas emissions associated with residential buildings.
11. Summary of Unresolved Comments and Negative PC Votes:

Mr. Rosenstock is concerned that the scope is too expansive, and the addition of new building types will be too complex. He also has issues with the new definitions for “energy performance” and “greenhouse gas performance” being too vague and general while also being too selective regarding emission types that are covered.

Mr. Lord’s disagreed with the elimination of the 3-story limit due to the presence of commercial systems in such buildings, and based on potential conflict with other ASHRAE standards like 189.1.

Ms. Petrillo-Groh disagreed with making 90.2 a high-efficiency residential standard because the result is that ASHRAE no longer offers a minimum efficiency residential standard. She then suggested changing the numbering to 189.2 in keeping with its high-performance goals. She also thought the scope should be altered to avoid conflict with Standards 100, 90.1, and 189.1.

Mr. Culp supported the numbering change idea explained above and expressed the same concerns regarding confusion between 90.2 and 90.1 now that both standards cover high-rise residential buildings.



As unresolved objectors, Mr. Rosenstock, Mr. Lord, Ms. Petrillo-Groh (AHRI), and Mr. Culp should be offered the right to appeal.

12. Summary of PC Response
Unresolved Comments and
Negative PC Votes:

The committee responded by topic as follows:

Expansion to cover high-rise residential (Rosenstock, Lord, Petrillo-Groh, Culp)

The committee responded that the change to high-rise reflects the direction that ICC is going with their complementary standard, RESNET/ICC 301. Furthermore, the committee does not see an issue with going beyond three stories because large 3-story buildings already require central HVAC systems.

Expansion to cover retrofits (Rosenstock, Petrillo-Groh)

90.2 has recognized there is a need to address retrofits as explained in the foreword to Addendum c. The committee has worked with Standard 100 representatives to ensure that the new scope does not create an overlap issue. Instead, SSPC 90.2 views the two standards as complementary because 90.2 can be used for dwelling units while Standard 100 cannot.

Switching to high-performance (Petrillo-Groh)

The response emphasizes that the concept of minimum versus leadership is subjective and continually evolving. While Standard 90.2 does go beyond current 90.1 and IECC requirements, it has more stringent peers within the ASHRAE portfolio such as 227 and 228. As laws and adoption patterns change, and progress in achieving net zero and net carbon strategies is realized, 90.2 may once again be used as a minimum standard.

Language issues (Rosenstock)

The language was crafted with the intention of expanding the scope without over-specifying the sort of new requirements that could result from its application. The new language illustrates possible uses of the scope without mandating that it must occur (for example: Scope 3 emissions could be covered in the future, but not at the exclusion of other types of emissions.)

13. Galley Status:

The Chair has approved the galleys.

Addendum c – TPS Change



ANALYSIS SHEET

RECOMMENDATION TO BOARD OF DIRECTORS FOR APPROVAL TO PUBLISH PROPOSED STANDARD/GUIDELINE/ADDENDUM

1. Designation: BSR/ASHRAE/ICC/USGBC/IES Addendum v
ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2020, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*
2. Chair: Katherine Hammock
3. Cognizant TC: TC 2.8
4. Public Review Dates: 1st Public Review (FULL): April 29, 2022 to May 29, 2022
2nd Public Review (ISC): November 11, 2022 to December 11, 2022
5. Comments Received: 1st Public Review (FULL): 4 comments from 4 commenters
2nd Public Review (ISC): 0 comments from 0 commenters
6. Unresolved Comments: 3 unresolved comments
7. PC Approval Vote: 20-0-0-4-4 (1st Public Review Vote)
23-0-0-2-6 (2nd Public Review ISC Vote)
19-0-0-6-3 (Final Publication Vote with Knowledge of Unresolved Objectors)
(Yes-No-No without comment-Abstain-Ballot not returned)
8. Total # Unresolved Objectors: There are 3 negative commenters and remain unresolved: Shafer, Rittmueller, and Rawlings.
9. StdC Vote for Approval: TBD (Yes-No-Abstain)
10. Description: Addendum v to 189.1-2020 adds language to clarify how cSTC is calculated and how Lmax is measured. Maximum sound pressure levels are now required to use “slow-weighting”, except as required in 8.3.3.2.2. Table 8.3.3.2 is edited for clarification with updates to the footnotes.
11. Summary of Unresolved Comments and Negative PC Votes: 3 negative commenters remain unresolved. Shafer asks for the removal of cSTC as a standard measurement for interior sound since there is not a standardized classification or measurement methodology for sound measurement. Shafer also points to other methods for sound measurement found in ASTM standards. Rittmueller suggested removing the requirement for using cSTC to measure maximum interior background sound pressure levels in the building envelope. Rittmueller cites Bies & Hansen and recommends specific instructions to calculate the cSTC since there are some situations and assumptions which may not be applicable for all building types. Rawlings states the language is ambiguous and difficult to enforce. Rawlings also points to other ASHRAE documents with different criteria to measure sound levels stating these too are not comparable, enforceable, and confusing.



All three commenters disagreed with the use of cSTC for interior background noise measurement. There are no negative voters for this addendum for public review nor for publication.

12. Summary of PC Response
Unresolved Comments and
Negative PC Votes:

The committee responded to all commenters and invited them for further discussion. Email correspondence of this discussion is captured in the attached folder. Responses to comments were approved and are provided. The commenters responded to the committee-approved response and remain unresolved. Their responses are provided in the comment report. Shafer, Rittmueller, and Rawlings should be offered the right to appeal.

13. Galley Status:

Pending request: The Chair has not approved the galleys.

*Addendum v – Acoustics
Clarification to L_{max} and cSTC for interior
background sound noises*



ANALYSIS SHEET

RECOMMENDATION TO BOARD OF DIRECTORS FOR APPROVAL TO PUBLISH PROPOSED STANDARD/GUIDELINE/ADDENDUM

1. Designation: BSR/ASHRAE/ICC/USGBC/IES Addendum w
ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2020, *Standard
for the Design of High-Performance Green Buildings Except Low-
Rise Residential Buildings*
2. Chair: Katherine Hammock
3. Cognizant TC: TC 2.8
4. *Public Review Dates: 3rd Public Review (FULL): April 02, 2021 to May 02, 2021
4th Public Review (ISC): January 21, 2022 to February 20, 2022
** 1st and 2nd PR were in the previous publication cycle and since 3rd
PR was a full review, only the 3rd PR and 4th PR ISC are addressed.*
5. Comments Received: 3rd Public Review (FULL): 4 comments from 2 commenters
4th Public Review (ISC): 3 comments from 3 commenters
6. Unresolved Comments: 3 unresolved comments
7. PC Approval Vote: 20-5-0-2-2 (3rd Public Review Vote)
20-6-1-1-0 (4th Public Review ISC Vote)
21-7-1-0-2 (Final Publication Vote with Knowledge of Unresolved
Objectors)
(Yes-No-No without comment-Abstain-Ballot not returned)
8. Total # Unresolved Objectors: There are 6 negative voters who remain unresolved (Bradley,
Conrad, Cross, Hogarth, VanGeem, and Subasic) and 3 unresolved
commenters (Persily, Subasic, and VanGeem). In total there are 7
unresolved objectors.
9. StdC Vote for Approval: TBD (Yes-No-Abstain)
10. Description: Addendum w to 189.1-2020 adds airtightness testing requirements
and increases the stringency of air testing requirements. The
airtightness requirements changed in 90.1 and 189.1 decided to have
a more stringent air leakage rate range of 0.20 cfm/ft² (1.0 L/s m²) to
0.35 cfm/ft² (2.0 L/s m²).
11. Summary of Unresolved
Comments and Negative PC
Votes: Persily (3rd PPR) suggests 10.6 b is deleted and if not deleted to
change the trigger metric from 0.40 cfm/ft² to 0.30 cfm/ft². This was
modified in the ISC to 0.35 cfm/ft². Bradley, Cross, and Conrad,
believe these requirements are too stringent to be met. Buildings of
certain sizes may fail this test (Conrad). The cost for reaching a
marginally lower air leakage rate may not outweigh the benefits.
VanGeem and Subasic (4th PPR ISC) both believe the research does
not show an adequate amount of proof to promote a lower air leakage
rate, saying there is a diminishing return on cost to reduce the air
leakage. Hogarth (4th PPR ISC Ballot) states the more stringent these
requirements without benefit is an unjustified cost and discourages
adoption of the standard.



12. Summary of PC Response
Unresolved Comments and
Negative PC Votes:

The committee responded to all commenters and invited them for further discussion. The three unresolved commenters responded to the committee-approved response and remain unresolved. Persily finds the response unconvincing. VanGeem and Subasic believe the response does not change their stance. Their reasons as negative voters are similar. They state there is diminishing returns which does not provide enough evidence to support the more stringent requirements. Their full responses are provided in the comment report and publication ballot report. Bradley, Conrad, Cross, Hogarth, VanGeem, Subasic, and Persily should be offered the right to appeal.

13. Galley Status:

Pending request: The Chair has not approved the galleys.

*Addendum w – Air tightness
Changes to requirements to ranges for air leakage
testing due to the changes in 90.1-2022.*



ANALYSIS SHEET

RECOMMENDATION TO BOARD OF DIRECTORS FOR APPROVAL TO PUBLISH PROPOSED STANDARD/GUIDELINE/ADDENDUM

1. Designation: BSR/ASHRAE/ICC/USGBC/IES Addendum x
ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2020, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*
2. Chair: Katherine Hammock
3. Cognizant TC: TC 2.8
4. *Public Review Dates: 1st Public Review (FULL): July 8, 2022 to August 7, 2022
5. Comments Received: 1st Public Review (FULL): 0 comments from 0 commenters
6. Unresolved Comments: 0 unresolved comments
7. PC Approval Vote: 22-1-0-3-2 (1st Public Review Vote)
24-1-0-3-3 (Final Publication Vote with Knowledge of Unresolved Objectors)
(Yes-No-No without comment-Abstain-Ballot not returned)
8. Total # Unresolved Objectors: There is one negative voter, Schoen.
9. StdC Vote for Approval: TBD (Yes-No-Abstain)
10. Description: Addendum x to 189.1-2020 aligns the occupancy definitions and groups to the International Building Code.
11. Summary of Unresolved Comments and Negative PC Votes: Schoen disagrees and believes this should be defined by the jurisdiction. Schoen offers a change to the language which would resolve him.
12. Summary of PC Response Unresolved Comments and Negative PC Votes: The task group responded to the negative voter via email. The committee's response rejects the comment and points out that using other definitions of occupancy classification risks future conflict. The purpose of this addendum was for alignment to the IBC. Schoen remains unresolved should be offered the right to appeal.
13. Galley Status: Pending request: The Chair has not approved the galleys.

*Addendum x – Occupancy Groups
Changes to occupancy classifications are defined
by the International Building Code (IBC).*



ANALYSIS SHEET

RECOMMENDATION TO BOARD OF DIRECTORS FOR APPROVAL TO PUBLISH PROPOSED STANDARD/GUIDELINE/ADDENDUM

1. Designation: BSR/ASHRAE Standard 228-202x, *Standard Method of Evaluating Zero Net Energy and Zero Net Carbon Building Performance*
2. Chair: Keith Emerson
3. Cognizant TC: TC 2.8 and TC 7.6
4. Public Review Dates: 1st Public Review (FULL): April 2, 2021, to May 17, 2021
2nd Public Review (ISC): January 28, 2022, to March 14, 2022
3rd Public Review (ISC): August 26, 2022, to October 10, 2022
5. Comments Received: 1st Public Review (FULL): 137 comments
2nd Public Review (ISC): 34 comments
3rd Public Review (ISC): 20 comments
6. Unresolved Comments: 1st Public Review (FULL): 28 unresolved comments from 8 commenters.
2nd Public Review (ISC): 3 comments from 2 commenters
3rd Public Review (ISC): 7 comments from 2 commenters
TOTAL: 38 comments from 10 commenters
7. PC Approval Vote: 13-0-0-1-1
(Yes-No-No without comment-Abstain-Ballot not returned)
8. Total # Unresolved Objectors: Ten (10) - There are 38 unresolved comments from 10 commenters (listed below).

Unresolved commenters/comments:

1st Full PPR (28 comments from 8 commenters)

- Luke Leung 0003/010, 014, 017
- Jonathan Humble 0005/001, 002, 003, 005, 006
- Steven Rosenstock 0008/004, 005, 006, 007, 008, 009, 016
- John Cross 0009/003
- Roger Hedrick 0010/001
- Mark Heizer 0012/001
- Leonard Sciarra 0019/002, 003, 004, 007
- Renee Lani 0025/006, 007, 008, 009, 010, 011

2nd ISC PPR (3 comments from 2 commenters)

- Steven Rosenstock 0002/001, 002
- Jim Edelson 0008/002

3rd ISC PPR (7 comments from 2 commenters)

- Steven Rosenstock 0001/001, 002, 003, 004, 005
- Gary Heikkinen 0004/001, 002

9. StdC Vote for Approval: TBD (Yes-No-Abstain)



10. Description: Standard 228-202x sets requirements for evaluating whether a building or group of buildings meets a definition of “zero net energy” or whether those buildings meet a definition of “zero net carbon.” It provides a consistent method of expressing qualifications for zero net energy and zero net carbon buildings associated with the design of new buildings and the operation of existing buildings.

11. Summary of Unresolved Comments and Negative PC Votes: There are 38 unresolved comments from 10 commenters. There are 4 negative PC votes on the vote for the 2nd ISC publication public review (Paul Torcellini, Jim Edelson, Scott Hackel, and Brendan Owens). Paul Torcellini did not provide a reason for his negative vote.

Unresolved comments are spread over four public reviews: the first for the TPS, the second a full public review and then two independent substantive change reviews. The largest category for being unresolved on normative material is proposed changes to definitions used by the committee. The second largest category is proposed changes to table values: different methodology, add additional types of values, deleting a particular table entirely or doing the procedure a different way. The third largest consists of different proposals for carbon offset procurement, requirements, and the discount used to recognize the imperfect nature of the current marketplace. Tied for that third place are TPS change proposals regarding carbon and various modifications suggested for the scope. There were also two miscellaneous comments dealing with renewable energy procurement and one comment against counting refrigerant losses as operational.

12. Summary of PC Response to Unresolved Comments: Please see comment reports and final publication submittal form for the PC responses to unresolved commenters.

13. Galley Status: The Chair has not approved the galleys.

Standard 228-202x – Standard Method of Evaluating Zero Net Energy and Zero Net Carbon Building Performance