Shaping Tomorrow's Built Environment Today

MINUTES

REF-CPCC
June 22, 2025
Sheraton Phoenix Downtown
Phoenix, AZ

MEMBERS PRESENT:
Doug Scott, *Chair*
Don Brandt, *Vice-Chair*
Andrew Beall
Wade Conlan, *Coordinating Officer*
Charles Hon
Dustin Lilya
Cesar Lim
Bruce Lindsay
Apichit Lumlertpongpana
Bruce Nelson *(virtual attendee)*
Heather Schopplein, *BOD Ex-O*
Roddam Anish Simha
Harshal Surange *(virtual attendee)*
Gratiela Maria Tarlea *(virtual attendee)*
Xudong Wang
Davide Ziviani

MEMBERS NOT PRESENT:
None

GUESTS:
Noor Alam, *Incoming Member*
Petros Dalavouras, *Incoming Member*
Alvaro de Leon
Steven Elbel, *Incoming Member*
Martin Dierczyk
Nitin Karwa
Steve Kujak
Tais Mitchell
Stan Naboney
Mike Saunders
Takashi Usui
Quinn Vo
Kanstabh Wani
Shitong Zha, *Incoming Member*

ASHRAE STAFF:
Donna Daniel, AMR
Steve Hammerling, MORTS
Heather Pierce, TSE
Amber Thomas, AA

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MOTIONS

No.	Motion	Status
1	That the draft minutes from the Spring virtual meeting (April 14, 2025) be approved.	
2	that REF-CPCC Reference Manual be approved.	
3	that REF-CPCC recommend to Honors & Awards Committee that Nasser Karimzadehmet win the Milt Garland Award.	

ACTION ITEMS – 2025 Annual Meeting

No.	Responsibility	Action Item	Status
1	Staff	Share REF-CPCC budget with committee leadership for each meeting	
2	Nelson	Review and submit a PD request for a PD on Cold Chain	
3	Staff	Update the form and Milt Garland award details on the ASHRAE website	

ACTION ITEMS – 2025 Spring Meeting

No.	Responsibility	Action Item	Status
1	Scott	Meet with Schopplein concerning member categories and changes to guidance documents	Complete
2	Brandt	Coordinate with Marketing concerning World Refrigeration Day	Complete
3	Staff	Connect Beall with ASHRAE Marketing to assist with Trends in Refrigeration Report format	Complete

OPEN ACTION ITEMS – 2025 Winter Meeting

No.	Responsibility	Action Item	Status
2	Awards Subcommittee	The subcommittee agreed to craft specific changes to award procedures for next meeting	Complete
3	REF-CPCC	Members were asked to review and provide feedback on Trends in Refrigeration Report	Ongoing
6	Brandt & Schopplein	Explore Refrigeration Cocktail Party with YEA for Las Vegas meeting	Ongoing

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LIST OF ATTACHMENTS

No.	Attachment
A	2024-25 Final Report
B	MOP and Reference Manual change presentation
C	Revised Manual of Procedures
D	Revised Reference Manual
E	Mentor assignments, subcommittee assignments, and liaisons
F	Notes from the Cold Chain subcommittee meeting
G	PD on Cold Chain presentation
H	Global Trends in Refrigeration Technology document
I	Refrigerants and their Responsible Use Position Document revision draft
J	PEAC leadership presentation

LIST OF ACRONYMS

AHRI	Air-conditioning Heating and Refrigeration Institute	MOU	Memorandum of Understanding
ASHRAE	American Society of Heating, Refrigerating and Air-conditioning Engineers	NASRC	North American Sustainable Refrigeration Council
BOD	Board of Directors	OPS	Operations Subcommittee
CEBD	Center of Excellence for Building Decarbonization	PD	Position Document
CNV	Chair Not Voting	REF	Refrigeration Committee
CO	Coordinating Officer	RFP	Request for Proposals
CTTC	Chapter Technology Transfer Committee	ROB	Rules of the Board
DRSC	Document Review SubCommittee	SME	Subject Matter Expert
Ex-O	Ex-Officio	SY	Society Year
GCCA	Global Cold Chain Alliance	TC	Technical Committee
HVAC&R	Heating, Ventilation, Air Conditioning & Refrigeration	TPS	Title, Purpose and Scope
MBO	Management by Objectives	UNEP	United Nations Environment Programme
MOP	Manual of Procedures	YEA	Young Engineers in ASHRAE

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1. **CALL TO ORDER**
Chair Doug Scott called the meeting to order at approximately 8:00 AM MST.

2. **WELCOME**
Members and guests in attendance introduced themselves. This was a hybrid meeting so those participating virtually introduced themselves as well.

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

Code of Ethics
Core Values
Diversity Statement

4. **QUORUM DETERMINATION**
Quorum was confirmed with all (14 of 14) voting members attending. One non-voting member and four ASHRAE staff were present as well. Four incoming members to REF-CPCC were in attendance as well.

5. **REVIEW OF AGENDA**
No changes were suggested to the meeting agenda sent ahead of meeting.

6. **MINUTES**
(1) It was moved (Beall) and seconded (Brandt) that the draft minutes from the Spring virtual meeting (April 14, 2025) be approved.

BACKGROUND: Draft minutes were distributed May 2, 2025.

MOTION 1 VOTE: 13-0-0 CNV - PASSED

7. **ACTION ITEM REVIEW**
Action Items for this meeting would be tracked and listed in minutes. A summary is listed in these minutes.

8. **CHAIR'S REPORT – (Scott)**
A. Review Committee Roster
Outgoing members Apichit Lumlertpongpana, Roddam Anish Simha and Xudong Wang.

B. Incoming members were welcomed, including Petros Dalavouras, Noor A. Alam, Stefan Elbel, Danielle Wright and Shitong Zha. Doug Scott would continue as a consultant. Thanks to all incoming members who attended this meeting.

C. SY 24-25 MBOs
A final report on 2024-2025 MBOs (**Attachment A**) would be reported to Operations

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Subcommittee.

a. MBO 1 - Refrigerants and their Responsible Use Position Document
A final draft PD was completed and submitted in May. The PD committee has reviewed and addressed comments from REF-CPCC, DRSC, Tech Council and BOD. DRSC is considering approval Tuesday.

b. MBO 2 - Committee organization changes for improved outcomes
REF-CPCC approved the proposed new standing subcommittees in ORL. A motion to change the REF-CPCC Reference Manual is on the agenda for Annual Meeting. A non-voting member category is being proposed in REF-CPCC MOP.

c. MBO 3 - Promotion of Awards
REF-CPCC discussed ideas to help get more Milt Garland award submissions in ORL. Two Garland Award submissions were received for 2025. Changes were made to simplify and improve the award and evaluation process, subject to review and approval in Phoenix.

d. MBO 4 - Promote and support World Refrigeration Day
REF-CPCC coordinated ASHRAE Marketing on content for WRD promotion. The ASHRAE 2025 promotion plan includes: Press Release, Social post, ASHRAE insights blurb, Chapter Notes blurb, updating the UNEP portal, and the Refrigeration Page. This year's theme is "Cool Skills"

e. MBO 5 - Work with partnership organizations
REFCPCC is meeting with refrigeration-related organizations, investigating goals and coordination methods. A new MOU has been developed with IIAR (subject to approval) and MOUs are in discussion GCCA and NASRC. The non-voting member updates will facilitate ongoing organization involvement (e.g. AHRI).

f. MBO 6 - Consider and potentially establish an "R in ASHRAE Cocktail Party" for Winter meetings
Discussed partnering with YEA. REF-CPCC will aim to have at the Winter Meeting but it was recognized that scheduling for Annual Meeting may be easier with a lighter schedule.

g. MBO 7- Provide support for Special Projects Committee CEBD refrigeration-related projects
Bruce Nelson continues to liaise with CEBD. Two projects in the works from CEBD include participation from REF-CPCC members: "Refrigerant Emissions Management, Tracking and Compliance" & "Decarbonization Strategies for Supermarket Industry Archetypes". Nelson highlighted the following points:
   - Circulate as soon as works are drafted
   - Come up with useable database for leaks?
   - Take guides further in saving energy and decarbonization
   - Asking for the technical side, have the funding requested and will be approved in the budget (He's on tech council sitting in)
   - Study in California on decarbonizing grocery stores to add (Naboney)

h. MBO 8 - Global Trends in Refrigeration Technology

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Beall noted work is underway, global contacts are identified, but this will be ongoing effort into the next FY.

i. MBO 9 - Develop and implement refrigeration needs and gaps survey for ASHRAE membership
REF-CPCC reviewing scope and purpose of survey to help focus questions. Key effort of Planning Subcommittee, working on scope and methods.

D. Subcommittee reorganization and MOP, Reference Manual changes
Scott summarized changes to the MOP and Reference Manual in a presentation (**Attachment B**).

a. MOP
Proposed changes to the Manual of Procedures were distributed before the meeting (**Attachment C**). Schopplein noted she'd reviewed and thought it needed some changes before approval. Scott noted the concept is important to have set before the next meeting. MOP needs OPS and Tech Council approval.

b. Reference Manual
Changes to the Reference Manual were distributed before the meeting (**Attachment D**).

(2) It was moved (Brandt) and seconded (Lindsay) that REF-CPCC Reference Manual be approved.

BACKGROUND: Draft minutes were distributed May 2, 2025.

MOTION 2 VOTE: 13-0-0 CNV - PASSED

Staff was asked to share REF-CPCC budget with committee leadership for each meeting (**Action Item 1**).

E. Committee Assignments
A list of mentor assignments, subcommittee assignments, and liaisons is included in **Attachment E**.

The purpose of mentors is to update new members on the focus, objectives, procedural documents and operation REF-CPCC. All voting members should be on one or the other committees (Communications & Planning). Non-members could be assigned to subcommittees and help with tasks.

F. ASHRAE Guide for Sustainable Refrigerated Facilities and Refrigeration Systems (2nd Ed.)
It was proposed that this be considered as an MBO next year.

9. <u>LIAISON REPORTS</u>
Chair Scott invited liaison reports. Some liaisons were not in attendance. Here is a summary of liaisons that were in attendance and issued a report.

A. GCCA (Awujoola)

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Ade Awujoola was not in attendance but Brandt noted he was attending their upcoming meeting in San Antonio.

B. AHRI – (Wang)
Wang emphasized the need to continue research to support ASHRAE standards 15 and 15.2 and testing related to A2L, A2 and A3 safety issues.

10. REF SUBCOMMITTEE REPORTS:

A. Communications - Nelson
The subcommittee met prior to this meeting. Nelson would chair the subcommittee in SY 25-26. Subcommittee activities are listed in newly updated Reference Manual.

B. Planning – Ziviani
Planning Subcommittee activities are listed in newly updated Reference Manual. Ziviani would chair the subcommittee in SY 25-26.

C. Cold Chain – Surange
Notes from the Cold Chain subcommittee meeting are included as **Attachment F**.

- Cold Chain Position Document TPS (Nelson)
Nelson presented a slide on a possible new ASHRAE PD on Cold Chain (**Attachment G**) noting there is a need for this guidance. Cold chain is a big part of ASHRAE's decarbonization goals. Nelson would review and submit a PD request for REF-CPCC to consider at a future meeting (**Action Item 2**).

D. Awards – Lumlertpongpana
Two nominations for the Milt Garland award would be considered later in Executive Session.
Changes to the Reference Manual to help solicit more nominations were approved earlier. REF-CPCC can continue to help promote.

E. H in Refrigeration – Brandt
Brandt reported that he has a meeting with TC 10.1 on heat pumps in July.

F. Trends in Refrigeration Report – Beall
Beall noted he made contact with ASHRAE marketing for help. A draft is included in **Attachment H**.

G. Refrigerants and their Responsible Use Position Document – Lilya
Lilya revised the position document based on review comments (**Attachment I**). DRSC will consider for approval at their meeting Phoenix. The Board of Directors could approve at their meeting on Wednesday.

11. Special Projects/CEBD report – Bruce Nelson
A report on CEBD was issued earlier under MBO updates.
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12. BOD/TECH COUNCIL REPORTS

A. BOD Ex-Officio – Schopplein

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Schopplein presented the PEAC leadership report (**Attachment J**). Highlights of interest to REF-CPCC included:

- New strategic plan on website – www.ashrae.org/strategicplan.
- Over 100 government outreach events the past society year
- GAC is looking for subject matter experts (SMEs) to speak to policymakers. Email GovAffairs@ashrae.org if interested.
- CEBD issued 2 RFPs issued for projects in May. 2 more anticipated for August.

B. Coordinating Officer – Conlan
Conlan thanked committee members for their work of the last Society Year.

13. 2025-2026 MBOs – Brandt

REF-CPCC MBOs were due to OPS in Fall 2025.

14. EXECUTIVE SESSION

Milt Garland Award recommendation

(3) It was moved (Wang) and seconded (Brandt) that REF-CPCC recommend to Honors & Awards Committee that Nasser Karimzadehmet win the Milt Garland Award.

BACKGROUND: Draft minutes were distributed May 2, 2025.

MOTION 3 VOTE: 12-0-1 - PASSED

15. NEW BUSINESS

Staff was asked to update the form and Milt Garland award details on the ASHRAE website (**Action Item 3**).

16. NEXT MEETING(s)

A. Subcommittee meetings – Hold virtual meetings ahead of main REF-CPCC meeting in Fall
B. Fall 2026 Virtual Meeting – Staff will poll for best meeting date and time

17. ADJOURNMENT

Scott adjourned meeting at approximately 11:45 AM MST.

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Technology Council | Date: 06/22/25 | **Chair:** Doug Scott
REF-CPCC | **Vice-chair:** Don Brandt

Description	Metric	Presidential Init. #	SP Init #	SP Goal #	Completion %	Financial Assist Req'd?	Comments/Activities supporting MBO
(how do we determine success?)							
1. Refrigerants and their Reponsible Use Position Document					**95% as of 6/22/25**	NONE	A. Identify a lead REF - CPCC member and review team to update report: *done* B. Develop a draft revision of position document: *target 1Q25* C. Complete for submission to DRSC: *target May 25* A final draft PD was completed and submitted in May. The PD committee has reviewed and addressed comments from REF-CPCC and upper bodies and pending from Dustin. **A draft PD is being considered for approval by DRSC/TechC/BOD in Phoenix.**
2. Committee organization changes for improved outcomes			3		**100% as of 6/22/25**	NONE	A. Evaluate and define priorities in line with ROB and committee structure (e.g. term); evaluate essential committees and activities, deal with the "big issues" B. Determine how non-voting members, liaisons and other contributors can be involved more effectively, in standing and/or ad hoc efforts (formal and practical aspects) C. Develop process to communicate to Regional and Chapter refrigeration chairs on REF-CPCC activities D. Prepare changes to ROB/MOP if and as required **REF-CPCC approved the proposed new standing subcommittees in ORL. Details were updated in Reference Manual approved 6/22.**
3. Promotion of Awards (ongoing)				2,3	**100% as of 6/22/25**	NONE	A. Awards committee activity C. Promote communications of refrigeration-related awards via ASHRAE newsletter B. Milt Garland submissions by May 1st **REF-CPCC discussed ideas to help get more Milt Garland award submissions in ORL. Two Garland Award submissions were received for 2025. Changes made to simplify and improve the award and evaluation process in the Reference Manual was approved in Phoenix.**
4. Promote and support World Refrigeration Day (ongoing)					**100% as of 6/22/25**	NONE	A. Contact WRD Committee in January 2025: Done B. Offer support: Done C. Consider specific focus or activity by REF-CPCC **REF-CPCC coordinated ASHRAE Marketing on content for WRD promotion.**
5. Work with partnership organizations (ongoing)			1,2	1	**75% as of 06/22/25**	NONE	A. Create list of organizations and contacts (already involved such as IIAR, IIR and prospective such as IoR, NASRC) B. Along with MBO #2, clarify liaison methods and means of involvement, and how it has value for these organizations C. Review budget impacts and discuss priority recommendations for paid liaisons travel (e.g. GCCA, others) D. Consider if a co-sponsored refrigeration-related event (e.g. conference) could be unique, useful, generate revenue, membership or benefit for ASHRAE (2025-2026) **Ref-CPCC is meeting with refrigeration-related organizations, investigating goals and coordination methods. A new MOU has been developed with IIAR (subject to approval and MOUs are in discussion GCCA and NASRC. The non-voting member updates will facilitate ongoing organization involvement (e.g. AHRI).**
6. Consider and potentially establish an "R in ASHRAE Cocktail Party" for Winter meetings					**10% as of 4/18/25**	YES	A. Discuss nature, benefit, promotion, cost, justification B. If desired, establish subcomittee and determine if feasible for 2025, or more likely target 2026 **Discussed partnering with YEA. Aim for upcoming Meeting. REF-CPCC seeking sponsorship.**
7. Provide support for Special Projects Committee CEBD refrigeration-related projects (ongoing)					**50% as of 4/18/25**	YES	A. Provide liaison to Special Projects: Bruce Nelson B. Identified projects are "Refrigerant Emission Management, Tracking and Compliance", and "Decarbonization Strategies for Supermarket Industry Archtypes" C. REF-CPCC responsibility is reasonably well defined and project work is beginning, additional contributors likely needed **Bruce Nelson continues to liaise with CEBD. Two projects in the works from CEBD include participation from REF-CPCC members. One project is on supermarket decarbonization and another on a refrigerant leakage database. Draft work statements will be sent to committee for review when available.**
8. Global Trends in Refrigeration Technology					**50% as of 6/22/25**	NONE	A. Lead: Andrew Beall (replaces: Bi-Annual Refrigeration Technology Report) B. Attractive 4 page (11x17), focused, visual C. Audience: ASHRAE members as well as aligning with strategic recommendations to leadership **Work underway, global contacts identified, ongoing effort into the next FY.**
9. Develop and implement refrigeration needs and gaps survey for ASHRAE membership (typ 5 year cycle)					**10% as of 6/22/25**	YES	A. Develop survey in alignment with MBO #2 to identify the big issues and member needs, helping provide direction for REF-CPCC and recommendations to ASHRAE B. Address budget justifications, send survey by 3-4Q25, scope input from prior chairs, e.g. Rajan R. **REF-CPCC reviewing scope and purpose of survey to help focus questions. Key effort of Planning Subcommittee, working on scope and methods.**

REF-CPCC REFERENCE MANUAL AND MOP SELECT INFO FOR DISCUSSION ANNUAL MEETING JUNE 22, 2025

COMMUNICATIONS SUBCOMMITTEE OPERATION AND SCOPE

The subcommittee chair shall be the Vice Chair of the REF-CPCC Committee.

Activities of the communication subcommittee include:

- Provide response to routine information requests to REF-CPCC.
- Recommend and organize seminars and presentations on refrigeration.
- Participate in the development of educational products.
- Help develop position documents and public policy.
- Nominate Distinguished Lecturers.
- Coordinate features for the ASHRAE Journal.
- Promote and coordinate ASHRAE Refrigeration Awards with our Society and the HVACR industry (Ref Section G).
- Other activities assigned by Chair to meet REF-CPCC objectives

PLANNING SUBCOMMITTEE OPERATION AND SCOPE

The subcommittee chair shall be appointed by the Committee Chair.

Activities of the planning subcommittee include:

- Identify major trends and "gaps and needs" in refrigeration globally, present to committee leadership and members, and recommend actions.
- Develop and draft annual recommendations for the ASHRAE strategic planning process for review with the Committee (ROB 2.420.004 Strategic Plan). Recommendations will be in advance of the Annual meeting or as requested.
- Develop and/or support refrigeration-related social events and outreach activities to build awareness and region and chapter levels. A member of the Planning Subcommittee will be the CTCC liaison from REF-CPCC (Ref duties in D2.2).
- Other activities assigned by Chair to meet REF-CPCC objectives

SECTION G: MILTON W. GARLAND COMMEMORATIVE AWARD FOR REFRIGERATION PROJECT EXCELLENCE

The Milton W. Garland Commemorative Award for Refrigeration Project Excellence is an ASHRAE award to honor outstanding projects that demonstrate innovation and advancement in the field of refrigeration. The award will encompass commercial and industrial refrigeration applications, including but not limited to food processing and preservation, the cold chain, industrial processes, and industrial heat pumping systems. The award may consider innovation and excellence in technology, application, advanced design, project practices and operation.

SECTION G: MILTON W. GARLAND COMMEMORATIVE AWARD FOR REFRIGERATION PROJECT EXCELLENCE

The Award Subcommittee shall judge the award submissions using the following points criteria:

Complexity of Project Requirements	(20 Points)
Innovation and Originality	(25 Points)
Energy Efficiency and Sustainability	(25 Points)
Construction Practice Advancements	(10 Points)
Advanced Operation and Maintenance	(10 Points)
Completeness of Award Submission	(10 Points)

ROB AND MOP RE NV MEMBERS

2.420.002 MEMBERSHIP

2.420.002.1 Composition) (23-02-08-11/91-01-24-63/99-01-28-80/99-06-24-36/00-02-10-64B/06-01-26-29)
The members of this committee are as follows

A. Fourteen (14) voting members, including a chair and a vice chair.

B. Non-voting members include a Board ex-officio member and coordinating officer.

C. Non-voting members from liaison associations shall be assigned by the Society President as appropriate.

D. Chairs of ASHRAE Committees shall be assigned as non-voting members as appropriate.

F1.1 Non-Voting Members from liaison associations are assigned by the Society President, for a term of one year. The Chair may provide recommendations annually by March 1.

F1.2 Chairs of ASHRAE committees may be assigned as Non-Voting Members of the Committee as appropriate. This may be initiated by the REF-CPCC Chair or the ASHRAE committee chair and shall be determined based on reciprocal interest. The assignment will be reviewed annually by the incoming Chair.

F2.1 Non-Voting Members shall attend meetings of the REF-CPCC Committee and subcommittees to which they are assigned.

F2.2 Non-Voting Members shall participate in all Committee communications, including distribution of meeting minutes and Basecamp access.

MANUAL OF PROCEDURES

FOR

REFRIGERATION TECHNOLOGY

COMMITTEE

FOR

COMFORT PROCESS AND COLD

CHAIN

REVISED: June 22, 2025
Approved:

MANUAL OF PROCEDURES
FOR
REFRIGERATION TECHNOLOGY COMMITTEE
FOR
COMFORT PROCESS AND COLD CHAIN

FOREWORD

The Refrigeration Technology Committee for Comfort Process and Cold Chain (REF-CPCC) is a General Standing Committee of the Society and operates under the direction of the Board of Directors and Technology Council. The Rules of the Board (ROB) for the Refrigeration Technology Committee for Comfort Process and Cold Chain (REF-CPCC) is its constitution. Proposed changes to the ROB and its appendices must be approved by the Board of Directors.

This Manual of Procedures (MOP) describes mandatory operational rules and interpretations of policy that the REF-CPCC body must operate under to achieve their assigned responsibilities. It is designed to complement the ROB by providing methods and procedures under which to operate. The MOP, and revisions thereto, following approval by the Committee, shall be submitted to Technology Council or designated council subcommittee for approval. (ROB 96-02-18-07)

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SECTION A - REFRIGERATION COMMITTEE - GENERAL

Part 1 Responsibilities/Duties

The REF-CPCC Committee shall encourage the broad advancement of refrigeration technology and its application. (2.420.001)

A1.1 Committee shall promote refrigeration education and development at the chapter, regional and international levels of the Society.

A1.2 The Committee shall recommend projects and programs related to refrigeration to Technology Council.

A1.3 The Committee shall maintain liaison with ASHRAE Chapters and other general committees within ASHRAE regarding refrigeration subjects.

A1.4 The Committee shall assist and advise the TCs and TGs with refrigeration-oriented goals.

A1.5 The Committee shall maintain contact and encourage technology transfer with other refrigeration-oriented international and technical societies.

A1.6 The Committee shall assist CTTC, as appropriate, with refrigeration-oriented activities.

Part 2 Membership

A2.1 Refer to ROB Section 2.420.002 for information on the composition and requirements for membership on this committee.

Part 3 Meetings

A3.1 The Committee shall have two (2)-scheduled meetings annually at the Society Winter and Annual meetings. Additional electronic meetings may be held at the call of the Chair.

Part 4 Operations

A4.1 Specifics of Committee operations are detailed in the Reference Manual.

SECTION B - CHAIR, VICE CHAIR AND STAFF LIAISON

Part 1 Selection

B1.1 The Chair and Vice Chair of REF-CPCC are nominated by the President-elect of the Society from the current membership of REF-CPCC and approved by the Board of Directors to serve a one-year term commencing at the close of the next annual meeting of the Society.

Part 2 Responsibilities of the Chair, Vice Chair & Staff Liaison

B2.1 Refer to REF-CPCC Reference Manual Section B. OPERATIONS for a list of duties and responsibilities for the Chair, Vice Chair and Staff Liaison.

SECTION C - DUTIES OF VOTING MEMBERS

Part 1 Responsibilities

C1.1 Attend all meetings of the REF-CPCC Committee.

C1.2 Perform MBO tasks and other duties as assigned by the Chair.

C1.3 Encourage REF-CPCC Committee formation and activity in each chapter through liaison with CTTC. One member shall also serve as a liaison to the Chapter Technology Transfer Committee (CTTC).

C1.4 Recommend, via the President-Elect Advisory Committee, criteria for Chapter Refrigeration activities in the Presidential Award of Excellence program.

C1.5 Report regional activities at the Annual and Winter meetings of the REF-CPCC Committee.

C1.6 Assist and advise the TCs, TGs and SSPCs with refrigeration-oriented goals including (a) programs at Society Meetings, (b) research projects and (c) technical committee membership.

C1.7 Voting members may be required to serve as Committee Liaisons. (See Section D)

C1.8 Annually, determine the winners of the REF-CPCC Awards
- Milton W. Garland Commemorative Refrigeration Award for Project Excellence

C1.9 Sponsor or co-sponsor programs at Society meetings on refrigeration to educate ASHRAE members as specified in A1.1.

SECTION D – COMMITTEE LIAISONS

Part 1 Selection

D1.1 The REF-CPCC Committee shall provide liaisons to represent the REF-CPCC Committee at CTTC, TCs, TGs, SSPCs, committees and other refrigeration related ASHRAE activities such as programs and workshops.

Part 2 Duties

D2.1 The liaisons will provide a written report to the REF-CPCC Committee on all pertinent refrigeration-related issues and information as related to the other committees. These reports shall be presented at the Annual and Winter meetings. A summary of the activities of each liaison shall be included with the REF-CPCC Committee minutes.

D2.2 The members appointed to CTTC will assist chapter and regional activities in the field of refrigeration.

a. Provide recommendations to the REF-CPCC Committee for PAOE point criteria in refrigeration for the President-Elect Advisory Committee.
b. Assist all CTTC RVCs with CRC workshop materials and presentations pertaining to refrigeration.

D2.3 Liaise with other Society Committees (see A1.3) and identify refrigeration related speakers/presenters for their programs when requested.

SECTION E – SUBCOMMITTEES

E1.1 Standing Subcommittees of the REF-CPCC Committee are organized by the Chair as necessary to satisfy the needs of the committee.

E1.2 Ad hoc subcommittees may be appointed by the Chair of the committee with the approval of REF-CPCC Committee.

E1.3 The Chair shall form additional subcommittees as needed to conduct the business of the Refrigeration Committee in a practical and efficient manner. As conditions change, the Chair may dissolve these subcommittees. Both their appointment and dissolution require approval of REF-CPCC Committee.

E1.4 The Chair shall appoint the members and chair of each subcommittee, with the consent of REF-CPCC Committee. The chair of each subcommittee must be a member of REF-CPCC Committee. The Chair may appoint additional subcommittee members who are not members of the REF-CPCC Committee when there is a need for members who have expertise and experience in certain areas that are of immediate importance and not available from the REF-CPCC Committee members.

E1.5 Subcommittee members are appointed for the Society year. If a member's term of service on the committee continues into the next Society year, they may be re-appointed to the same or different subcommittee by the incoming Chair.

E1.6 Subcommittees shall meet in person or via web meetings, typically four (4) times per year in advance of REF-CPCC meetings, or as needed to complete committee work. Subcommittee chairs shall report on subcommittee activities at REF-CPCC Committee meetings and provide a written report to be included in the report for Tech Council at the Winter and Annual meetings.

SECTION F – NON-VOTING MEMBERS

Part 1 Selection

F1.1 Non-Voting Members from liaison associations are assigned by the Society President, for a term of one year. The Chair may provide recommendations annually by March 1.

F1.2 Chairs of ASHRAE committees may be assigned as Non-Voting Members of the Committee as appropriate. This may be initiated by the REF-CPCC Chair or the ASHRAE committee chair and shall be determined based on reciprocal interest. The assignment will be reviewed annually by the incoming Chair.

Part 2 Duties

F2.1 Non-Voting Members shall attend meetings of the REF-CPCC Committee and subcommittees to which they are assigned.

F2.2 Non-Voting Members shall participate in all Committee communications, including distribution of meeting minutes and Basecamp access.

REFERENCE MANUAL
FOR
REFRIGERATION TECHNOLOGY COMMITTEE
FOR
COMFORT – PROCESS – COLD CHAIN (REF-CPCC)

REVISED: June 22, 2025
Approved:

FOREWORD

The REF-CPCC Reference Manual, contains guidelines, procedures, sample documents and other tools that the committee uses in its day-to-day operation. The Reference Manual ensures consistency in the operation of the REF-CPCC and serves as an educational tool for new members. The Reference Manual is an internal document of the REF-CPCC and requires the approval of this committee only

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SECTION A: ABREVIATIONS AND ACRONYMS

CRC	Chapter Regional Conference
CTTC	Chapter Technology Transfer Committee
BOD	Board of Directors
REF-CPCC	Refrigeration Technology Committee for Comfort – Process – Cold chain
MOP	Manual of Procedures
ROB	Rules of the Board
RVC	Regional Vice-Chair
MORTS	Manager of Research and Technical Services
TC	Technical Committee
TG	Task Group
TRG	Technical Resource Group

SECTION B: OPERATIONS (Chair, Vice Chair, and Staff Liaison)

This section provides details on the responsibilities and duties of the Committee members as presented in the Manual of Procedures, under Section B Part 2 of MOP.

1. Chair Duties & Activities

- Preside over all meetings of the REF-CPCC Committee.
- Coordinate and direct the activities of the Vice Chair and those of the voting members through MBOs and other assignments.
- Organize REF-CPCC subcommittees as necessary to satisfy the needs of the committee as indicated in the REF-CPCC Reference Manual.
- Prepare the agenda for all REF-CPCC Committee meetings with staff support.
- See that minutes are recorded for all REF-CPCC Committee meetings.
- See that the following reports are to be submitted to Technology Council with a copy to the Refrigeration BOD Ex-O and to the MORTS:
  - Management By Objectives (MBOs)
    - The Annual Meeting MBO report shall be a final report of the committee's MBOs for that Society Year to show the council what the committee accomplished during the Society year that is ending.
    - The Annual Meeting shall also include review of the MBOs prepared by the incoming chair to show what is planned for the upcoming Society Year. These MBOs will be submitted following the Annual Meeting, no later than the fall Technology Council meetings.
- Annually submit to the President-Elect of ASHRAE recommendations for a Chair, a Vice Chair, and replacement members for any members who are leaving the committee for any reason.
- Recommend one member of the committee to serve as a consultant of the CTTC committee.
- Appoint liaisons to TCs, TGs, SSPCs and any other refrigeration-related committees.
- Appoint at the final meeting of the Fiscal Year a mentor for each new incoming member of the

committee.

- Maintain a list of invited guests for the Winter and Annual meetings to help maintain current communications and engagement with relevant committees, organizations and individuals.

2. Vice Chair Duties and Activities

- The Vice Chair is responsible for budget preparation and review of expenditures. In consultation with the Technology Council, the REF-CPCC Committee, the Director of Technology, and the MORTS, the Vice Chair shall prepare recommended budgets for the operation of the REF-CPCC Committee for the coming fiscal year for consideration by the REF-CPCC Committee and Technology Council. Details can be found in the Technology Council MOP and/or Reference Manual.
- In the absence of the Chair, assume the chair position at scheduled or called meetings of the REF-CPCC Committee.
- In the event the Chair is unable to perform the duties of that office, assume all duties of the Chair until a successor is selected.
- The Vice Chair shall serve as the chair of the REF-CPCC Communications Committee.
- The Vice Chair shall serve as a member of the Operations Subcommittee of Technology Council.
- Periodically, the Vice Chair shall review with the MORTS expenditures and budget allocations and shall take any action he/she deems necessary, in cooperation with the Executive Vice President and the Director of Technology, to stay within the established budget.
- Encourage refrigeration technology transfer within the Society by working with the Chapter Technology Transfer Committee (CTTC), Research Administration Committee Research Liaisons, and with the Technical Activities Committee Section Heads, particularly Section 10, to stimulate: (a) programs at Society Meetings, (b) research projects and (c) technical committee membership.
- Be responsible for regular review of the REF-CPCC Committee's Guidance Documents (Rules of the Board, Manual of Procedures, and Reference Manual) and make recommendations for revisions.
- Prior to the Society annual meeting, the committee vice chair or the individual who will be the next year's chair will prepare MBOs for the REF-CPCC committee for the next year and present these objectives to the REF-CPCC committee for review at the committee meeting held during the Society annual meeting. These MBOs will be submitted following the Annual Meeting, no later than the fall Technology Council meetings, with a copy of the MBOs sent to the REF-CPCC BOD Ex-O and MORTS. The committee MBOs shall be submitted using the ASHRAE MBO web form.
- Perform other duties, which may be assigned by the Chair.

3. Duties of Voting Members

- Attend all meetings of the committee.

- Perform MBO tasks and other duties as assigned by the Chair.
- Encourage REF-CPCC Committee formation and activity in each chapter through liaison with CTTC. One member shall also serve as a liaison to the Chapter Technology Transfer Committee.
- Recommend, via the President-Elect Advisory Committee, criteria for Chapter Refrigeration activities in the Presidential Award of Excellence program.
- Report regional activities at the Annual and Winter meetings of the REF-CPCC Committee.
- Assist and advise the TCs, TGs and SSPCs with refrigeration-oriented goals including (a) programs at Society Meetings, (b) research projects and (c) technical committee membership.
- Voting members may be required to serve as Committee Liaisons. (See Section D)
- Annually, determine the winners of the REF-CPCC Awards
  - Milton W. Garland Commemorative Award for Refrigeration Project Excellence
- Sponsor or co-sponsor programs at Society meetings on refrigeration to educate ASHRAE members as specified in REF-CPCC MOP A1.1.

4. Staff Liaison Duties and Activities
   - Attend all meetings of the committee.
   - Perform assignments made by the Chair.
   - Prepare draft of minutes, submitting to Chair and Vice Chair for comments.
   - Update Rules of the Board and Manual of Procedures at the direction of the Committee.
   - When appropriate, distribute to Committee members for review and possible update.
   - Distribute materials to the members for regular meetings of the Committee.
   - Assist with budget preparation.
   - Provide support for all awards presented by the Committee.
     - Procures all award materials given by REF-CPCC Committee.
     - Mails award materials to award recipients not present at Society meeting.
     - Milton W. Garland Commemorative Award for Refrigeration Project Excellence: distribute submissions to Review Subcommittee, collect and summarizes review scores
   - Post materials as directed by the Chair to the Committee's webpage.
   - Send to new committee members: Committee Job Description, Rules of the Board, Manual of Procedures, this Reference Manual, and other background material.
   - Provide society liaison reports to REF-CPCC.
   - Distribute the following materials for the meetings:
     - To all members, minutes of the prior meeting, agenda for current meeting, MBO list(s), travel voucher and other pertinent information.
     - To new committee members, Rules of the Board, Manual of Procedures, this

Reference Manual, and other background material.

SECTION C: MANAGEMENT BY OBJECTIVES

C.1 Each objective should be measurable and should include a projected completion date, fiscal impact (if any) and other information that would clarify the intent of the objective. If an objective is to be assigned to a specific member or subcommittee of the committee, this should also be included. See Figure C.1 for suggested format, or as defined in the ASHRAE online MBO web form.

C.2 MBO reports shall be reviewed at the Society Winter and Annual Meetings and submitted as defined in Chair and Vice Chair duties noted above.

FIGURE C.1
SUGGESTED MBO FORMAT

OBJECTIVES

_____Committee

Chairman: _____

Society Year: 20____- 20____

Date: _____

Objective	Planned Completion Date	Fiscal Impact	Responsibility	Program Approved	Cost Budgeted	Status

- List objectives, not action items or ongoing committee activities such as updating the committee's MOP.
- State objectives in clear, concise, measurable language. If necessary, cite sub-tasks and interim steps as a means of measuring objective completion.
- Cite both the completion dates for the overall objective as well as individual sub-tasks.
- State fiscal impact in dollars, man-hours, or man-trips. State whether the program has been approved by the council and whether its cost has been included in the budget.
- State the primary responsible individual, subcommittee, or body.
- Report a brief but complete statement of status. Cite completion date if objective is fulfilled.

95-02-01

SECTION D: COMMITTEE LIAISONS

Part 1 Selection

D1.1 The REF-CPCC Committee shall provide liaisons to represent the REF-CPCC Committee at CTTC, TCs, TGs, SSPCs, committees and other refrigeration related ASHRAE activities such as programs and workshops.

Part 2 Duties

D2.1 The Liaisons will provide a written report to the REF-CPCC Committee on all pertinent refrigeration-related issues and information as related to the other committees. These reports shall be presented at the Annual and Winter meetings. A summary of the activities of each liaison shall be included with the Refrigeration Committee minutes.

D2.2 The members appointed to CTTC will assist with chapter and regional activities in the field of refrigeration.

a. Provide recommendations to the REF-CPCC Committee for PAOE point criteria in refrigeration for the President – Elect Advisory Committee.
b. Assist all CTTC RVCs with CRC workshop materials and Presentations pertaining to refrigeration.

D2.3 Liaise with other Society Committees and Identify refrigeration related speakers/presenters for their program when requested.

SECTION E – SUBCOMMITTEES

E1.1 Standing and temporary (Ad hoc) Subcommittees of the REF-CPCC Committee are organized by the Chair as necessary to satisfy the needs of the committee.

a. Standing subcommittees are as follows:
    - Communications
    - Planning
b. Subcommittee members shall be appointed by the Chair and Vice Chair at the beginning of the Society year based on the expertise and stated preference of the committee members.
c. Subcommittee members who are voting members of REF-CPCC shall be voting members of the subcommittee.
d. Minutes or notes of each subcommittee meeting shall be posted on the REF-CPCC Committee Basecamp site.

E1.2 Communications Subcommittee Operation and Scope

a. The subcommittee chair shall be the Vice Chair of the REF-CPCC Committee.
b. Activities of the communication subcommittee include:
    - Provide response to routine information requests to REF-CPCC.
    - Recommend and organize seminars and presentations on refrigeration.
    - Participate in the development of educational products.
    - Help develop position documents and public policy.
    - Nominate Distinguished Lecturers.

- Coordinate features for the ASHRAE Journal.
- Promote and coordinate ASHRAE Refrigeration Awards with our Society and the HVACR industry (Ref Section G).
- Other activities assigned by Chair to meet REF-CPCC objectives

E1.3 Planning Subcommittee Operation and Scope

a. The subcommittee chair shall be appointed by the Committee Chair.
b. Activities of the planning subcommittee include:
    - Identify major trends and "gaps and needs" in refrigeration globally, present to committee leadership and members, and recommend actions.
    - Develop and draft annual recommendations for the ASHRAE strategic planning process for review with the Committee (ROB 2.420.004 Strategic Plan). Recommendations will be in advance of the Annual meeting or as requested.
    - Develop and/or support refrigeration-related social events and outreach activities to build awareness and region and chapter levels. A member of the Planning Subcommittee will be the CTCC liaison from REF-CPCC (Ref duties in D2.2).
    - Other activities assigned by Chair to meet REF-CPCC objectives

E1.4 Ad hoc subcommittees may be appointed by the Chair of the committee with the approval of REF-CPCC Committee.

E1.5 The Chair shall form additional subcommittees as needed to conduct the business of the REF-CPCC Committee in a practical and efficient manner. As conditions change, the Chair may dissolve these subcommittees. Both their appointment and dissolution require approval of REF-CPCC Committee.

E1.6 The Chair shall appoint the members and chair of each subcommittee, with the consent of REF-CPCC Committee. The chair of each subcommittee must be a member of REF-CPCC Committee. Chair may appoint additional subcommittee members who are not members of the REF-CPCC Committee when there is a need for members who have expertise and experience in certain areas that are of immediate importance and not available from the REF-CPCC Committee members.

E1.7 Subcommittee members are appointed for the Society year. If a member's term of service on the committee continues into the next Society year, they may be re-appointed to the same or different subcommittee by the incoming Chair.

E1.8 Subcommittees shall meet in person or via web meetings, typically four (4) times per year in advance of REF-CPCC meetings, or as needed to complete committee work. Subcommittee chairs shall report on subcommittee activities at REF-CPCC Committee meetings and provide a written report to be included in the report for Tech Council at the Winter and Annual meetings.

SECTION F: MENTORING PROGRAM

During the Annual Meeting, the Committee Chair shall appoint an incumbent to be the mentor for each new member. The mentor will be responsible for the following tasks: As soon as practical after the Annual meeting, the mentor should contact the new member by telephone, letter, fax or email to introduce himself/herself and explain the new relationship and its purpose.

The mentor should make every effort to update the new member on:

1. Committee or chapter functions focus and objectives.
2. Review the Rules of the Board (ROB) and Manual of Procedures (MOP) with the new member.
3. Discuss the typical meeting format and member duties and responsibilities.
4. Coordinate introduction to Basecamp features and utilization.

The mentor should plan to meet the new member before the respective meeting is scheduled to start and introduce him/her to the chair and early arriving members. The mentor should also introduce the new member with pertinent data such as:

1. Member's field of expertise and employer
2. Chapter and city of the new member
3. Former chapter, region and Society positions previously held by the new member

The new member will be sent a copy of the group Rules of the Board (ROB), Manual of Procedures (MOP) and a copy of the most recent meeting minutes to acquaint him/her with the function and focus of the group. The new member should be encouraged to develop a rapport with other members to effectively work with fellow members to maximize productivity.

The chair of the committee shall have the following responsibilities:

1. Assign a mentor to each incoming new member of the group prior to the first meeting.
2. Assure that the time allotted at the beginning of the first meeting is sufficient for proper introduction of the new member by the assigned mentor.
3. Assess at a later meeting the effectiveness of the mentor/new member relationship.
4. Provide any assistance to enhance the mentor/new member relationship.

Completion date: The mentoring responsibility concludes the end of the new member's first year on the Committee.

SECTION G: MILTON W. GARLAND COMMEMORATIVE AWARD FOR REFRIGERATION PROJECT EXCELLENCE

Award Description and Processes

Description:

The Milton W. Garland Commemorative Award for Refrigeration Project Excellence is an ASHRAE award to honor outstanding projects that demonstrate innovation and advancement in the field of refrigeration. The award will encompass commercial and industrial refrigeration applications, including but not limited to food processing and preservation, the cold chain, industrial processes, and industrial heat pumping systems. The award may consider innovation and excellence in technology, application, advanced design, project practices and operation.

Recognition:

The winning project will be recognized in the ASHRAE Journal and shall receive the following:

- The representative of the design team shall receive a plaque at the Society Winter Meeting.
- The project owner shall receive a plaque. The plaque will be presented at a chapter program meeting, if requested.

For all submissions by chapters, the chapters will receive the following recognition:

- For a winning project nominee, a felt patch for the chapter award banner. The patch will be presented at the next CRC meeting following the Society award presentation.
- For all submitted projects, a ribbon will be presented at the following year's CRC meeting.

Submission Criteria:

The awards are open to all to projects which meet the award description and the following criteria:

- Projects nominations may be prepared by the designer, architect, engineer, owner or supplier.
- A member of the project team or the owner must be an ASHRAE member. The nominator must inform and have permission from the owner of the project allowing the entry to be published. The owner's name may be withheld for privacy. A release for this purpose must be obtained from the owner (see Submission Form).
- All projects must be submitted no earlier than twelve (12) months preceding, and no later than forty-eight (48) months following, the initial operation date of the system.

Submission Format:

The project submission shall be formatted as follows:

- The front cover shall be the Award Submission Form.
- The second page shall contain no more than a two-paragraph overview of the project with a brief explanation of the factors supporting the nomination.
- The following pages shall contain a description of the project. The last pages of the submission

shall consist of drawings, plans, schematics, or pictures of the project which will give the judges a clear understanding of the project.

- The submission must be a single PDF file not exceeding 20 pages. Sheets must be letter size except drawings which may be larger.

Submission Process:

- Submissions must be sent to the REF-CPCC Committee Staff Liaison (TBD@ashrae.net) by May 1st to be considered for that year's competition.
- The Staff Liaison will submit a copy of the submission to the Chapter Technology Transfer Committee (CTTC) Regional Vice-Chair (RVC) for informational purposes.

REF-CPCC Committee Responsibilities

Part 1 Award Communications

G1.1 The Communications Committee shall develop a brief article calling for award nominations to be published in the Jan/Feb ASHRAE Insights. The Committee will also provide an email blast for distribution to chapters (from CTTC as well as from REF-CPCC) coordinated by ASHRAE staff.

G1.2 The Communications Committee shall create and maintain the ASHRAE website text describing the award and the downloadable application form.

Part 2 Award Evaluation

Upon receipt of award submissions, the following procedures will be followed:

G2.1 The Chair will review submissions for conformity with submission requirements. If requirements are not met, the Chair will advise the Staff Liaison whether the submission may be corrected or should be rejected.

G2.2 The Chair of the REF-CPCC Committee shall select at least three members on the Committee to serve as the Award Subcommittee.

G2.3 The Award Subcommittee shall judge the award submissions using the following points criteria:

Complexity of Project Requirements..... (20 Points)
Innovation and Originality ..... (25 Points)
Energy Efficiency and Sustainability..... (25 Points)
Construction Practice Advancements ..... (10 Points)
Advanced Operation and Maintenance ..... (10 Points)
Completeness of Award Submission ..... (10 Points)

G2.4 Scores and award recommendations shall be delivered to the REF-CPCC Committee Staff Liaison no later than 14 days prior to the Refrigeration REF-CPCC Committee's meeting at the Society

annual conference. The Award Subcommittee may conclude that the submission(s) do not meet the award scope or the quality to be considered for the award but must provide their conclusions and reasons in writing.

G2.5 The Chair of the Award Subcommittee shall present its recommendations for approval by the REF-CPCC Committee at the Annual Meeting.

Part 3 Staff Responsibilities

The REF-CPCC Committee Staff Liaison shall provide support through the following activities:

G3.1 Receive submissions and distribute to the Awards Subcommittee

G3.2 Collect and summarize ratings for review and voting by the full committee at the Society annual meeting.

G3.2 Procure all award and recognition materials as shown above for the awards and mail such materials to all recipients who are not present at the Society meeting.

G3.2 Provide description of the winning project to the ASHRAE Journal editor for publications.

Applying for (Check One)

AWARD SUBMISSION FORM

Milton W. Garland Commemorative Award for Refrigeration Project Excellence

1. **Name of building or project:** _____

Initial Date of Operation: _____

ASHRAE Member Submitting: _____

2. **Award Winner** (note person listed here will be official winner of award, receive plaque at Plenary session, get travel reimbursement, etc.)
   a. Name: Role in project: ASHRAE Membership Number (if applicable): _____
   b. Address (including country): _____
   _____
   c. Office Telephone: _____
   d. E-mail address: _____
   e. Company: _____

3. **Co-Winner** (if appropriate only. Note there will be only the one official winner, but more can be recognized if warranted)
   a. Name: Role in project: _____
   ASHRAE Membership Number (if applicable): _____
   b. Address (including country): _____
   _____
   c. Office Telephone: _____
   d. E-mail address: _____
   e. Company: (please append additional names if appropriate)

4. **ASHRAE Linkage (**the prime designer is an ASHRAE member, the installer is a member, the firm is Golden Circle, or the owner, supplier, etc., is a member, etc. Note the person listed here does not receive award unless listed above).
   a. Name: ASHRAE Member Linkage: _____
   ASHRAE Membership Number: _____
   b. Address (including country): _____
   c. Office Telephone: _____
   d. E-mail address: _____
   e. Company: _____

5. **Owner's release:**
   I certify that I am the owner or the authorized representative of this project, and hereby grant permission to ASHRAE to use all the enclosed data and information in the judging and subsequent publicity of this project.
   Typed Name:
   a. Name: _____
   b. Title: _____
   c. Signature: _____
   (Signatures must be on form submitted to ASHRAE)
   Date: _____
   d. Company: _____
   e. Address (including country): _____
   f. Office Telephone: _____
   g. E-mail address: _____

SECTION H – REVISIONS TO RULES AND PROCEDURES

(This Section is for Informational Purposes Only)

Part 1: Revisions to Rules of the Board

H1.1 Proposed changes (additions and deletions) to Rules of the Board (ROBs) shall be submitted by committees, councils and Board members. Changes proposed by a committee shall be submitted through the body to which it reports; councils and Board members may submit proposed changes directly to the Board of Directors.

H1.2 To propose a change to an existing ROB

Present the current ROB with changes marked by double underlining to designate words proposed to be added and strikethrough to designate words proposed to be deleted. A proposed change, as a minimum, shall include the complete ROB number (e.g., 2.106.001.2), the proposed change(s) marked as indicated above, and the reason(s) for the change(s).

H1.3 To propose a new ROB, present the wording for the new rule and include a statement indicating a recommended placement of the new rule within the ROB organization. Examples:
It is recommended that this rule be placed in ROB Volume 1, Policies.
It is recommended that this rule be placed in ROB Volume 2, Publishing and Education Council.

H1.4 To propose rescinding an existing ROB, include in the recommendation the ROB volume in which the rule is located, the rule number or other identification code, and the wording of the rule to be rescinded.

H1.5 Proposed changes to Society-wide policies and procedures (e.g., Travel Reimbursement Policy, Election and Appointment Procedures) shall follow the same procedure as for changes to ROBs.

Part 2 Revisions to Manuals of Procedures (MOP)

H2.1 Revisions to this MOP must be approved by this committee and by Technology Council or designated council subcommittee.

REF-CPCC 2025-26 Mentor Assignments

Proposed 6/22/25

See Reference Manual Section F: MENTORING PROGRAM

New Member	Mentor
Petros Dalavouras	Cesar Lim
Noor A. Alam	Bruce Lindsay
Stefan Elbel	Harshal Surange
Danielle Wright	Davide Ziviani
Shitong Zha	Dustin Lilya

Andrew Beall
Bruce Nelson
Gratiela Maria Tarlea

REF-CPCC 2025-26 Committee Assignments

Proposed 6/22/25

Consider non-voting members as they become available

Non-members can be considered as defined in Reference Manual E1.6

Communications Committee

SY 25-26

Bruce Nelson (subc chair)	2027
Petros Dalavouras	2028
Noor A. Alam	2028
Stefan Elbel	2028
Danielle Wright	2026 (+)
Shitong Zha	2028

Dustin Lilya
Andrew Beall
Bruce Nelson
Harshal Surange
Don Brandt
Gratiela Maria Tarlea
Davide Ziviani
Cesar Lim
Bruce Lindsay
Petros Dalavouras
Noor A. Alam
Stefan Elbel
Danielle Wright
Shitong Zha
Doug Scott

Planning Committee

SY 25-26

Davide Ziviani (subc chair)	2027
Dustin Lilya	2026
Andrew Beall	2026
Harshal Surange	2026
Gratiela Maria Tarlea	2027
Cesar Lim	2027
Bruce Lindsay	2027

Trends in Refrigeration Ad Hoc

Andrew Beall (subc chair)	2027
Danielle Wright	2026 (+)
Bruce Nelson	2027

H in Refrigeration Ad Hoc

Don Brandt (subc chair)	2026

Cold Chain PD Ad Hoc

Bruce Nelson (subc chair)	2027
Harshal Surange	2026

REF-CPCC 2025-26 Liaison Assignments

Discussion 6/22/25

See Reference Manual Section D: COMMITTEE LIAISONS

Committee	Liaison
CTTC	
10.1	
10.2	
10.6	
10.7	
8.2	
TAC	
RAC	
SSPC-15	

Member of Planning Subcommittee

Dustin Lilya
Andrew Beall
Harshal Surange
Gratiela Maria Tarlea
Davide Ziviani
Cesar Lim
Bruce Lindsay
Petros Dalavouras
Noor A. Alam
Stefan Elbel
Danielle Wright
Shitong Zha

Other TCs?

REF-CPCC ROSTER SY 2025-2026

	End of Term	Name
1	Jun-26	Dustin Lilya
2	Jun-26	Andrew Beall
3	Jun-27	Bruce Nelson
4	Jun-26	Harshal Surange
5	Jun-26	Don Brandt
6	Jun-27	Gratiela Maria Tarlea
7	Jun-27	Davide Ziviani
8	Jun-27	Cesar Lim
9	Jun-27	Bruce Lindsay
10	Jun-28	Petros Dalavouras
11	Jun-28	Noor A. Alam
12	Jun-28	Stefan Elbel
13	Jun-28	Danielle Wright
14	Jun-28	Shitong Zha
	Jun-26	Doug Scott

Minutes and Notes for Ref-CPCC Cold Chain Subcommittee meeting – 23rd May 2025

Chair – Harshal Surange

Subcommittee Participants :

Attended : Bruce Nelson, Apichit Ipana, Anish Simha, Charles Hon

ASHRAE Staff : Steve Hammerling, Heather Pierce

Could not attend : Dustin Lilya, Ziviani Davide,

Meeting notes and Minutes :

1. Meeting called to order

   ASHRAE VALUE STATEMENT was read out as per protocol

2. Round of introductions : The participants gave a short introduction of themselves.
3. Discussion on the key requirements from this sub-committee

   The cold chain subcommittee can do a significant role in creating recommendations for improvement in cold chain for the developing world

4. Brainstorming on new ideas for subcommittee activities
   a. Trainings

      1] It was suggested that there can be Uniform topics & contents which can be developed by ASHRAE and then a given trainer can add other points as may be felt relevant to the location / audience

      Some Suggested topics :

      - Maintenance & troubleshooting of Industrial Ref plants & Commercial ref plants
      - Pre-commissioning & Commissioning of Indl ref plants & Commercial ref plants
      - Safety & avoiding Hazards (Technically Tight system, keeping the refrigerant inside the system) in Indl Ref plants & Commercial ref plants
      - Leak mitigation & refrigerant handling
      - Definition of tight systems
      - Break the training into two separate topic – Indl Ref & Commercial ref
      - Post harvest cooling
      - Transport refrigeration
      - Freezing
      - CA Stores
      - Mid level segment that needs a proper solution to use instead of HFCs (CO2 in Europe is a mid-range refrigeration)
      - Best practices for efficiency and sustainability
      - A3 units – packages less than 150 gm as a start for developing countries
      - Industrial community requirement – safety

Other notable points for information :

There was a Training Manual (done by UN) for HC based units (– for info). We can request UNEP for HC training – as well as sponsored trainings

Small package systems which can be accomplished (less than 150gm) is a good starting point for developing economies. HFC price point can be similar to HC package units ; 2 systems of HCs can be an option instead of one larger HFC units with a lower power consumption. Good requirement for training

b. DLs – It was informed that DL suggestions can be given to ASHRAE from Refrigeration and Cold Chain field

c. Ammonia leakage inside a chamber – This was a topic that was brought about to invite thoughts from the sub-committee members in a view to understand whether it can be taken up as a separate item
Discussion : Ammonia exposure to fish has been observed , but not documented. Ammonia being soluble in water, any exposed food product will have ammonia going into solution and violate the food structure, packaged food products may have a different scheme
Especially fruits can get damaged.
Suggestion : Charles and Bruce to send documents on HCs and German document (Bauer) for closed piping system for flammable refrigerants (#AI – 1)
Info : GIZ documents have been written for such stuff

d. Updation of the ASHRAE's Guide for Sustainable Refrigerated Facilities and Refrigeration Systems
Refer to Dustin on this topic

e. Any projects that can be suggested to Ref-CPCC to carry forward

5. Discussion on PD on Sustainable Cold Chain – IIR may have some similar document (Bruce to check with IIR) (#AI- 2)
6. Update on other Major events (WRD ?) - GCCC Pune, Harshal to send info (#AI-3)
7. Any other points

   R22 / 404A / Other HFCs systems running in developing countries, need to generate information on proper disposal and retrofit guidelines
   Apichit to send document on retrofit to the subcommittee (#AI-4)
   Milton Garland award – Apichit will send details to the committee members (#AI-5)

8. Adjournment of meeting – Harshal thanked all the participants for their valuable time and all that they do for ASHRAE. The meeting was adjourned.

Development of a Cold Chain Position Document (PD)

Currently no ASHRAE PD exists which addresses the Cold Chain

Related PD titles include:

- Building Decarbonization
- Climate Change
- Energy Efficiency in Buildings
- Refrigerants and Their Responsible Use

Several excellent sources of information on sustainability and the Cold Chain exist to draw from (ZECC (UK), UNEP, GCCA, etc.)

The PD will: a) cover Cold Chain decarbonization and/or sustainability opportunities in both developed and developing economies, and b) harmonize with existing related ASHRAE PDs (see above).

ASHRAE Refrigerant Trends

Purpose: To better inform industry stakeholder's decisions on refrigeration system design and equipment selection.

Objectives:

- Provide overview of global policy and regulations impacting refrigerants trends
- Identify low-GWP refrigerant trends and considerations by application type
- Most prevalent refrigerants used by region.
- Do not discuss heat pumps or HVAC
- Just cold change
- How refrigerants are used in systems
- Focus on refrigeration equipment that is being installed for new installations.

Audience (ranked in order):

1. Engineer and design professionals
2. End-users
3. Service contractors
4. Provide direction to local policy makers (local ASHRAE chapters)
5. Develop questions to ask the committee
    - Who is the audience
    - What are the local trends for members of the committee
    - How much do we want to add the regulatory information
    -

Principles:

- Follow ASHRAE principles
- Neutral and agnostic to any technology
- Short and concise reference document, no more than 4 pages

Table of Contents

1. Global policy landscape
    a. Refrigerant regulations by global region
2. Low-GWP Refrigerant trends
    a. Refrigerants by application
    b. Considerations (Safety, Market, Design)
3. Provide opportunities section on global changes – referencing ASHRAE goals around refrigerants
4. Research projects being done

Draft

1. Global policy landscape

The foundation for most refrigerant regulations is the Montreal Protocol, an international treaty established in 1987 to protect the ozone layer by phasing out ozone-depleting substances (CFCs and HCFCs). The Kigali Amendment to the Montreal Protocol, adopted in 2016, expanded the treaty's scope to include the phasedown of hydrofluorocarbons (HFCs), potent greenhouse gases, with timelines varying by country and development status.

As of late 2024, 163 states and the EU have ratified the Kigali Amendment. The amendment has driven the adoption of national and regional regulations, accelerated the transition to low-GWP refrigerants, and spurred innovation in refrigerant management and leak reduction. Each country implements the phasedown according to its own regulatory framework, but all are moving toward substantial reductions in HFC use over the next two decades.

North America (United States and Canada): The United States is implementing the HFC phasedown through the American Innovation and Manufacturing (AIM) Act, which aligns with the Kigali Amendment. The EPA's regulations require an 85% reduction in HFC production and consumption by 2036, compared to baseline levels. Starting January 1, 2025, certain high-GWP HFCs will be restricted in new equipment, and manufacturers must transition to low-GWP alternatives. Canada uses a quota and allocation system with GWP limits by sector, mirroring the phasedown timeline of developed countries under Kigali.

European Union: The EU's F-Gas Regulation is among the world's strictest. The EU has adopted the Kigali Amendment and is accelerating its HFC phasedown beyond the minimum requirements. The EU's F-Gas Regulation enforces a quota and allocation system, sector-specific GWP limits, and bans on certain high-GWP refrigerants. The EU aims for a 45% reduction by 2024 and an 85% reduction by 2036, but it has implemented some steps faster than the Kigali schedule, leading to a rapid transition to low-GWP refrigerants. The EU is also considering further restrictions on PFAS-containing refrigerants, which could further limit available options for the industry.

Asia (China, Japan, India, Australia): China, Japan, and India have ratified the Kigali Amendment and are classified in the second group under the agreement. These countries are committed to reducing HFC consumption by 80% by 2045, using a combination of quota systems, GWP limits, and sector-specific regulations. Japan, for example, also has reclaim requirements to encourage refrigerant recovery and recycling. Australia follows the Kigali Amendment but uses a more frequent step-down schedule, reducing HFC quotas every two years instead of every five. Australia also employs a refrigerant deposit system to incentivize the return and proper management of HFCs.

Latin America, Middle East, and Africa: Most countries in these regions have ratified the Kigali Amendment and are developing or implementing their own HFC phasedown policies, often with extended deadlines reflecting their development status and climate needs. Their phasedown deadline is extended to 2047, reflecting the region's heavy reliance on air conditioning and unique climate challenges. Some countries may request waivers due to consistently high temperatures. Regional regulations typically follow the Montreal Protocol's HCFC phaseout and are now focused on HFC reduction strategies, with technical and financial support from international programs.

2. Low-GWP Refrigerant Trends

Equipment Category	North America	Europe	Asia (China, Japan, India, Australia)	Latin America, Middle East, and Africa
Retail Food and Other Commercial Refrigeration				
Supermarket Systems (direct and secondary/indirect systems)	• R-744 available in transcritical and subcritical applications • Very few (<5) R-290 or R-717 secondary systems installed • One known installation of A2L (ref?)	• R-744 is dominant refrigerant choice for new systems (add citation for number of installations)	• Philippines: R-449a is available for drop-in for R-404a & R-507 but only a few users are doing this due to the high price of the refrigerant. •	
Remote Condensing Units	• R-744 available, limited adoption but growing number of manufacturers			
Self-contained Units (Stand-alone or Micro-distributed Systems)	• R-290 available in air-cooled or water loop system, charge limit recently increased to 300/500 grams		• Philippines: R-600a and R-290 used in stand-alone refrigerators and beverage coolers since 2015	
Industrial Process Refrigeration and Cold Storage				
Direct and Indirect Field-Erected Systems	• R-717, R744 available			
Packaged Chillers	• R-717, R744 available	• R-290 and CO2 options available for water-cooled chillers	• Philippines: o R- 717 (Ammonia) This has been used in Cold Storage, Food & Beverage Processing Plants since the early 1900's. Ammonia Low Charge Water / Glycol Package Chiller are locally manufactured and is being used Since 2002. o R-1233zd is the Replacement refrigerant (R-123) for the new Daikin, Carrier, York & Mitsubishi Chillers. It has been marketed here since 2022. o R-1234ze is the Refrigerant for New Chillers. All manufacturers are selling it instead of R-134a o	
Commercial AC and Heat Pumps				
Chiller Heat Pump	• R-717 available • R-744 limited availability	• R-290 and CO2 options available	• Australia: In 2022 approximately 50% of imported heat pumps were using HFC-410A, the majority are now charge with hydrocarbons.	
Packaged Units	• No natural refrigerant options available	• R-290 and CO2 options available		
Single-Split Systems	• No natural refrigerant options available	• R-290 and CO2 options available	• Philippines: R-290 showcased?	
Multi-Splits and Variable Refrigerant Flow Systems	• No natural refrigerant options available	• R-290 and CO2 options available		

a. Considerations
    1. Safety considerations for mildly flammable A2L refrigerants
    2. ~~Market impacts: availability, costs, retrofitting challenges~~
    3. ~~Impacts on equipment design, installation and servicing~~

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ASHRAE Position Document on

Refrigerants and Their Responsible Use

Approved by the ASHRAE Board of Directors [DATE]

Expires [DATE]

ASHRAE is a global professional society of over 55,000 members, committed to serving 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.

Refrigerants and Their Responsible Use is a Public Interest Issue

Heating, ventilation, air-conditioning, and refrigeration (HVAC&R) systems provide life-saving climate control and refrigeration (e.g., for food, medicine, etc.), but systems require energy to operate. Safe handling of refrigerants (e.g., due to flammability and toxicity) must be considered in system design, installation, maintenance and operation. The environmental fate of the increasing adoption of fluorinated refrigerants has been raised as a concern, including the phase out of ozone depleting substances (ODS) and phase down of high global warming potential (GWP) refrigerants. Many of these challenges relate to the initial selection of refrigerants and refrigerant management throughout a system's lifecycle.

The safe handling of newer refrigerants with respect to flammability and toxicity has resulted in many changes to various design standards, codes and regulations to mitigate these health and safety concerns.

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Beyond known refrigerant environmental impacts, recent broad policy proposals related to health concerns of certain persistent, bioaccumulative, toxic (PBT) fluorinated chemicals could limit available refrigerants, depending on the scope of any per- and poly-fluorinated alkyl substances (PFAS chemicals) regulations.

The economic driver of efficient energy use is more important with today's growing demand for electricity and the need to reduce the climate impact of carbon dioxide emissions.

These factors have made refrigerant choice increasingly complex. For example, selecting a lower-GWP refrigerant may reduce global warming potential. However, it may also reduce equipment efficiency, offsetting climate benefits, or may increase the risks to health and safety if not properly mitigated. No refrigerant selection is perfect, and therefore short-term and long-term environmental effects, health & safety (e.g., flammability, toxicity), equipment longevity, system performance, current & potential future regulations, codes, and standards, and refrigerant management must all be considered. Of course, proper system design, operation, and maintenance practices can mitigate refrigerant emissions and their effects.

Evolution of Refrigerant Selection

Evolving environmental standards are reshaping the HVAC&R industry, with refrigerant choice of ever-increasing importance for new and existing systems. Early refrigerant options included ammonia, carbon dioxide, sulfur dioxide, methyl chloride, ether, isobutane, propane, and ethyl ether. Except for ammonia in industrial applications, these were replaced by systems using safer chlorofluorocarbons (CFCs). CFCs were followed by hydrochlorofluorocarbons (HCFCs), both of which are phased out under the Montreal Protocol due to their ozone-depleting potential. Hydrofluorocarbons (HFCs) were adopted as replacements for both CFCs and HCFCs, but their high global warming potential (GWP) has led to increased restrictions.

Hydrofluoroolefins (HFOs), introduced more recently, offer lower GWP and zero or negligible ODP, but there has been greater interest in the emissions of refrigerant precursors and the environmental fate (e.g., atmospheric degradation and deposition) of halogenated gases including HFOs. In addition, some HFOs have lower flammability classified as A2L as defined in ASHRAE Standard 34. The global HVAC&R industry with ASHRAE leadership have invested heavily in understanding flammability safety with handling of newly developed lower GWP refrigerants. These actions have resulted in many changes to various design standards, codes and regulations to mitigate these health and safety concerns.

Additionally, the early refrigerants: ammonia (NH_3), carbon dioxide (CO_2), propane and isobutane are now widely selected for use in certain industries, with safer designs to mitigate flammability and

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toxicity concerns. These refrigerants are also being considered for broader use due to their ultra-low GWP and ODP.

The Kigali Amendment to the Montreal Protocol and policies such as the American Innovation and Manufacturing (AIM) Act in the U.S. and F-Gas regulations in Europe have driven the transition to lower-GWP refrigerants. This shift has led to the increased use of refrigerants with different safety characteristics, (e.g., lower flammability, toxicity or higher-pressure), requiring updated safety standards and increased workforce training.

Balancing Trade-Offs

No refrigerant is without trade-offs. Selection must consider factors including:

- Environmental impact (e.g. ozone layer and climate)
- Health & safety (e.g., flammability and toxicity)
- System energy efficiency
- Cost-effectiveness (first cost and total cost of ownership)
- Performance at high and low ambient temperatures
- Thermal Stability and Materials Compatibility
- Future projected availability of the refrigerant

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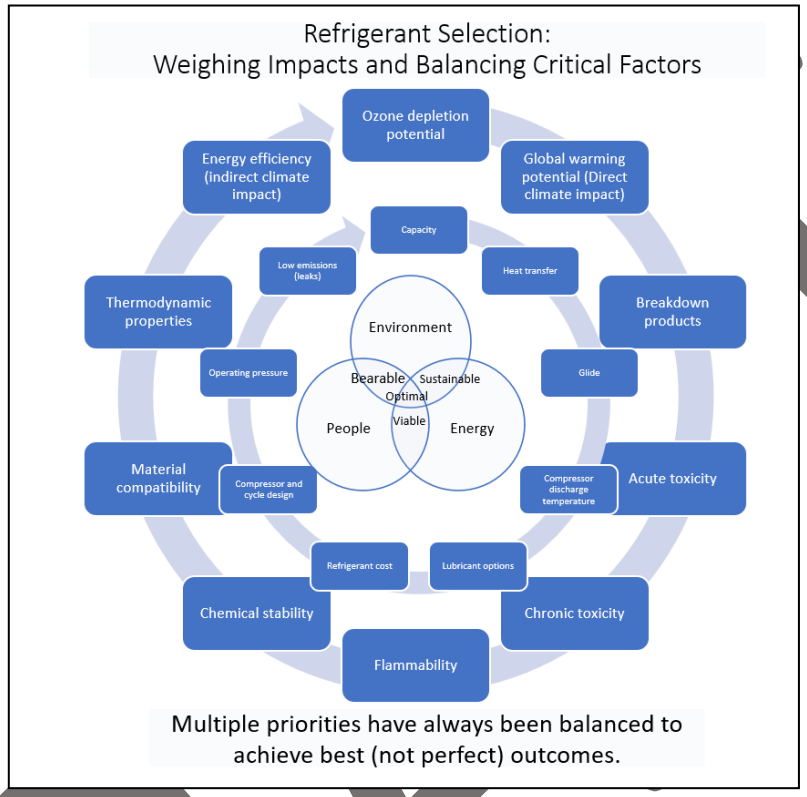

Lower-GWP refrigerants will introduce additional challenges, including specialized handling requirements, market acceptance, and end-of-life management. Proper refrigerant recovery, recycling, and disposal at system retirement are essential to minimize environmental impact.

ASHRAE's Role

ASHRAE plays a key role in guiding refrigerant selection and promoting sustainable HVAC&R practices. Through research, standards development, technical publications, training, and outreach, ASHRAE informs policymakers, industry professionals, and the public about refrigerant choices and their implications. The organization supports a balanced approach, ensuring that refrigerant decisions consider the many factors needed to optimize outcomes (e.g., efficiency, safety, environmental impact, and regulatory compliance.)

As industry evolves, ASHRAE and its members remain at the forefront of sustainable refrigeration development, advancing responsible refrigerant use for a more sustainable future.

Why ASHRAE Takes Positions on Refrigerants and Their Responsible Use:

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ASHRAE has a direct interest in refrigerant transitions because the operation of much of the HVAC&R equipment depends on refrigerants. ASHRAE contributed to the successful effort to phase out the ozone-depleting CFC and HCFC refrigerants, and it has a significant role to play in encouraging the proper and safe use of refrigerants going forward. ASHRAE plays an active role in the following areas: research, standards, codes, guidelines, technology transfer, policy, and education.

ASHRAE Takes the Positions That:

ASHRAE's positions on the responsible selection and use of refrigerants are as follows:

- Selection of refrigerants and system design should consider all factors holistically: current and future, global, national and local policies, energy efficiency and performance, environmental impacts, employee and public safety, and life-cycle operating economics. Outcomes will be based on all factors, even if a refrigerant is selected based on a single feature such as GWP, operating pressure, equipment first cost, or flammability.

- The wide range of HVAC&R application requirements, system types, and regional conditions and regulations throughout the world necessitates a similarly broad understanding and guidance to determine the refrigerants best suited for each need.

- All refrigerant emissions from HVAC&R systems should be minimized and proactively managed. This is accomplished by gaining a more accurate understanding of release rates and release quantities, and through substantial and comprehensive improvements in technology and operations.

- The phase-out of ozone depleting substances and the phase-down of hydrofluorocarbons presents a technical, economic and environmental impact challenge for selecting a refrigerant, especially when coupled with the rapid international growth in air conditioning and refrigeration and greatly varying impacts across global populations and sectors.

- ASHRAE has a responsibility to promote international and regional collaboration towards fundamental and common objectives, using scientifically based methods, to maximize societal benefits related to refrigerant selection and use in HVAC&R applications.

- Different jurisdictions may prioritize outcomes or create different regulatory structures leading to a more fragmented approach to refrigerant selection (e.g., the European Union Fluorinated (F) Gas Regulations compared to the approach of Environment Climate Change Canada or ECCC)

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- The use of refrigerants must follow relevant standards and codes. More widespread use of flammable refrigerants (e.g. HFOs) as well as the trend towards variable refrigerant flow HVAC systems require careful consideration to assure occupant health and safety requirements in standards and codes must be established using scientifically based methods.

ASHRAE Recommends That:

ASHRAE makes the following recommendations for actions by ASHRAE and by others in the following areas.

1. Research, Standards and Guidelines

ASHRAE should address the following:

- Continue the development and ongoing updates of standards needed to increase safe and effective adoption of low GWP refrigerants in all HVAC&R applications.
- Promote global adoption of ASHRAE safety standards and practices to support growth of ASHRAE's global membership.
- Promote research and develop standards related to effective and safe use of long-term alternatives including hydrocarbon refrigerants, including both smaller low-charge applications and high charge indirect AC&R and heat pumping systems.
- Quantify the advantages and disadvantages of refrigerant selection to inform refrigerant selection for various equipment types and settings.
- Research refrigerant emissions to more accurately quantify leak rates for a wide range of HVACR equipment. This information will help inform about cost effectiveness of policies, mitigation efforts, understanding of environmental impacts and potential future standards.
- Develop Guidelines to provide direction and methodology to achieve substantially reduced leak rates through technically and persistently tight system design and system maintenance, to address both packaged equipment and field-built systems.

2. Improved Design Practice

ASHRAE should promote the following, both within ASHRAE and through support of collaborative efforts:

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- Review of existing ASHRAE Standards and Guidelines to determine critical gaps and needs concerning refrigerant designation, classification, application and use within Standards.
- Quantify the advantages and disadvantages of refrigerants to inform refrigerant selection for various equipment types and regions.
- Development and use of tools for life-cycle analysis of new and existing facilities, allowing rapid and cost-effective comparison of refrigerants and system options, with a comprehensive methodology for safety compliance and maintenance, refrigerant emissions, energy efficiency and Life Cycle Climate Performance (LCCP).
- Advance the development of refrigeration and air-conditioning systems that both reduce refrigerant charge and reduce leak rate to minimize emissions during the life of the equipment.

3. Field Practices and Training

ASHRAE recommends the following:

- ASHRAE should continue to advance and improve methods to manage on-site emissions including, but not limited to, improved system tightness for leak prevention, good commissioning and installation practices, regular leak checking, monitoring, labeling, and record keeping.
- Owners, operators, and contractors should establish a comprehensive, ongoing refrigerant management program—covering retrofits, replacements, and regulatory compliance—aligned with corporate policy and guided by ASHRAE and industry best practices.
- Programs should define refrigerant recovery, recycling (reuse), reclamation, and safe disposal practices, including at the end of equipment life.

4. Regulations and Long-range Actions:

ASHRAE should promote and work with other organizations to achieve the following:

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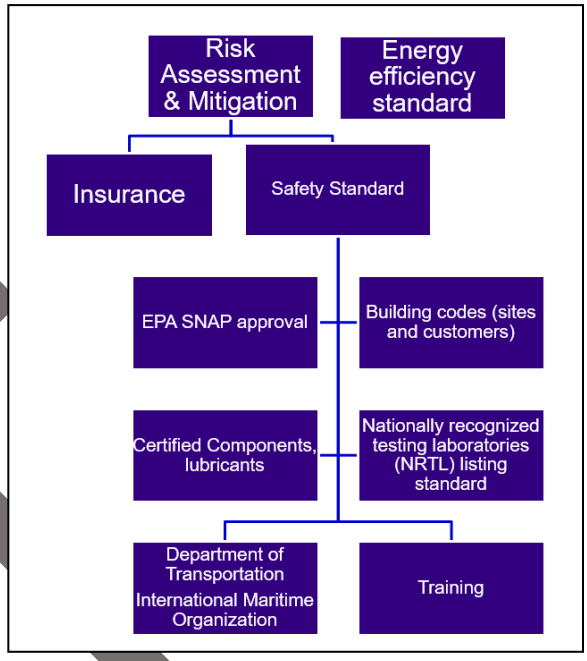
- Work with membership and ASHRAE partner organizations to identify research gaps to determine and mitigate risks and to upgrade standards. This may include technical metrics and standardization, support for sector-based sustainable procurement policies, and other limiting factors. Where ASHRAE has relevant capabilities; advance standards, training or other actions to promote more rapid deployment of responsible and effective low GWP solutions.



- Advance and promote the meaningful understanding of refrigerant emissions and their environmental impact including breakdown products.
- Provide leadership and advocacy for the HVAC&R and heat pumping industry. Support the development and effective use of long-term alternatives through collaborative research, standards and training.
- Advance and promote research and standards concerning refrigerant designation, classification and application to increase system resilience and reliability in consideration of future changes, including reduced water availability, increased weather design extremes, and evolving changes in power generation and storage.

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DOCUMENT REVISION COMMITTEE ROSTER

The ASHRAE Position Document on (Topic) was developed by the Society's Position Document Revision Committee formed on Date (Month, day, year), with (Dustin Lilya) as its chair.

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The chair of Technical Committee 3.1 and the chair of the Refrigeration CPCC Committee (ASHRAE Standing) also served as members.

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DOCUMENT HISTORY

Publication and Revision History

The following summarizes this document's revision, reaffirmation, or withdrawal dates:

1/25/2012—BOD approves Position Document titled *Refrigerants and Their Responsible Use*

7/2/2014—Technology Council approves reaffirmation of Position Document titled *Refrigerants and their Responsible Use*

1/30/2017—Technology Council approves reaffirmation of Position Document titled *Refrigerants and their Responsible Use*

6/27/2018—BOD approves Position Document titled *Refrigerants and their Responsible Use*

6/29/2020—Technology Council approves reaffirmation of Position Document titled *Refrigerants and their Responsible Use*

6/28/2023—Technology Council approves reaffirmation of Position Document titled *Refrigerants and their Responsible Use*

Note: ASHRAE's Technology Council and the cognizant committee recommend revision, reaffirmation, or withdrawal every 30 months.

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ASHRAE
Shaping Tomorrow's Built Environment Today
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ASHRAE Policies

Code of Ethics

We will act with honesty, fairness, courtesy, competence, inclusiveness and respect for others, which exemplify our core values of excellence, commitment, integrity, collaboration, volunteerism and diversity, and we shall avoid all real or perceived conflicts of interest.

Harassment and Discrimination

ASHRAE strictly prohibits and does not tolerate discrimination against members or applicants for membership because of such individual's race, color, religion, age, sex, sexual orientation, national origin, physical or mental disability, pregnancy, genetic information, veteran status, uniformed service member status, or any other category protected under applicable law.

Commercialism

ASHRAE's Commercialism Policy allows for Society activities that fulfill the mission of technological advancement with adherence to business plans that generate income to offset operational expenses such as AHR Exposition, ASHRAE periodicals, website, and Society conference events such as the Welcome Party, luncheons, registration kits, and receptions.

Value Statement

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

MARKETING CENTRAL

ASHRAE has a NEW TAGLINE! Shaping Tomorrow's ***Global*** Built Environment Today.

Download at Marketing Central

2025-28 ASHRAE Strategic Plan

1 Position ASHRAE as the **global leader** in advanced solutions to improve indoor environmental quality (IEQ) and address climate change.

2 Pursue **impact-focused engagement** by targeting stakeholders to support a strong workforce and maximize utilization, adherence, and trust of ASHRAE's global expert resources.

3 Increase the **accessibility** of ASHRAE content, resources, and member opportunities.

OBJECTIVES

a. Lead the development of widely adopted standards to support indoor environmental quality, decarbonization, and resilience.

b. Develop alliances and diverse working groups that position ASHRAE to lead and collaborate globally in identifying challenges, defining solutions, and developing approaches to address them.

c. Develop resources based on member needs and industry trends.

a. Tailor and target engagement and resources to ASHRAE members and defined key stakeholders.

b. Provide guidance to targeted stakeholders on impactful ways to maximize the positive downstream effect of their engagement on the built environment.

c. Empower professionals in their journey to maximize industry impact in support of ASHRAE's mission and vision.

d. Pursue partnerships to amplify the impact of ASHRAE's mission and support the HVAC&R and built environment workforce.

a. Identify and address structural, content, and financial barriers to access.

b. Align communication and delivery methods and formats to enhance accessibility and effectiveness of content, resources, and volunteer opportunities.

c. Strengthen communication channels with and through chapters and regions to empower contribution to the Society as thought partners in adapting resources to local context and needs.

2025-28 ASHRAE Strategic Plan

Healthy, Sustainable and Resilient Communities

Providing a healthy, productive and resilient indoor environment, while minimizing greenhouse gas emissions, is critical to today's built environment. Further, global stakeholders' leveraging of ASHRAE's standards and technical resources presents an opportunity for ASHRAE to solidify global leadership in supporting healthy, sustainable and resilient communities. ASHRAE prioritizes timely identification of industry trends, expedient content development, and forges key partnerships to advocate and collaborate with industry.

Empowered Workforce

The development of a skilled, competent, and solutions-oriented workforce is critical to addressing the challenges facing the built environment and the HVAC&R industry, today and in the future. ASHRAE continues to provide educational and professional development resources. Our members and industry partners need these tools to implement key initiatives such as decarbonization, resiliency, and indoor environmental quality goals and policies. ASHRAE, with the support of our chapters and regions, partners with key industry stakeholders in tackling the unique workforce challenges facing the industry globally.

Organizational Agility

ASHRAE's ability to serve communities, the industry, the current and future workforce, and provide value to its volunteer members, is dependent on forward-looking products, services, and solutions. ASHRAE will use emerging technologies to support the development of resources and knowledge flow between ASHRAE's chapters, regions, technical bodies, and the industry, harnessing organizational and operational efficiencies.

Emerging Technologies

In today's rapidly evolving landscape, emerging technologies are revolutionizing the built environment and HVAC&R industry, expanding numerous career opportunities. By combining technological advancements such as AI with human creativity, both seasoned professionals and new talent can collaborate to drive industry-wide progress. Advanced automation and AI-enabled systems propel energy efficiency and smart buildings, enhance comfort and IEQ, improve operations and maintenance, and deliver holistic and sustainable solutions for industry professionals. ASHRAE engages in a thoughtful process to evaluate and prioritize opportunities to leverage new technologies.

2025-28 ASHRAE Strategic Plan

Download in English and Spanish at

ashrae.org/strategicplan

ASHRAE Board of Directors

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Hudson, Massachusetts

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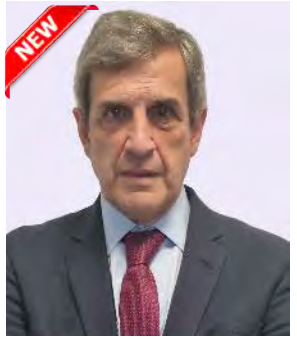
Midvale, Utah



Andres Sepulveda, P.E., Fellow ASHRAE
Madrid, Spain

ASHRAE Director and Regional Chairs

Region I

Charles Bertuch
Manlius, New York

Region II

Genevieve Lussier
Quebec, Canada

Region III

Sherry Abbott-Adkins, P.E., CPD, GPD, LEED AP Westminster, Maryland

Region IV

Heather Platt Gulledge, P.E., MBA
Summerfield, North Carolina

Region V

Julia Timberman, P.E.
Columbus, Ohio

Region VI

Maggie Moninski, P.E., LEED AP, BD+C
Chicago, Illinois

Region VII

Scott Peach, P.E.
Mobile, Alabama

Region VIII

Joseph Sanders
Oklahoma City, Oklahoma

Region IX

Jonathan Smith, P.E.
Kansas City, Missouri

Region X

Buzz Wright, P.E.
Tucson, Arizona

Region XI

Rob Craddock
Saskatchewan, Canada

Region XII

Jason Alphonso, P.E., OPMP, PMP
Winter Park, Florida

Region XIII

Ching Loon Ong, P.E., CMVP, Hon Fellow AFEO
Subang, Jaya, Malaysia

Region XIV

Mahroo Eftekhari, CEng., DPhil
Loughborough, UK

Region XV

Pankaj Dharkar, Fellow ASHRAE
Ahmedabad, India

Region-at-Large

Bassel Anbari, P.E.
Abu Dhabi, United Arab Emirates

ASHRAE Directors-at-Large

Doug Cochrane, P.Eng., CDP
Mississauga, Ontario, Canada

Steve Kujak
Brownsville, Minnesota

Patrick Marks, P.E.
York, Pennsylvania

Corey Metzger, P.E.
Papillion, Nebraska

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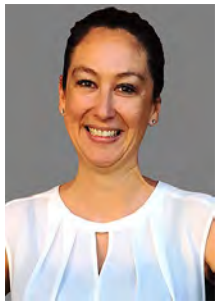
Oakland, California

Mike Pouchak, P.E., Fellow ASHRAE
St. Anthony, Minnesota

David Yashar, Ph.D., Fellow ASHRAE
Gaithersburg, Maryland

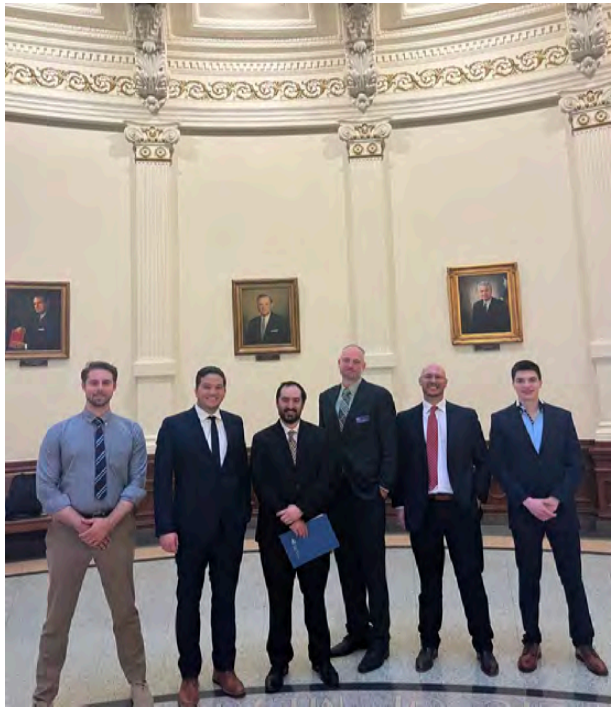
Daniel Nall
Princeton, New Jersey



Heather Schopplein-Anderson, P.E.
Santee, California

Government Affairs

GOVERNMENT OUTREACH



Get Involved!

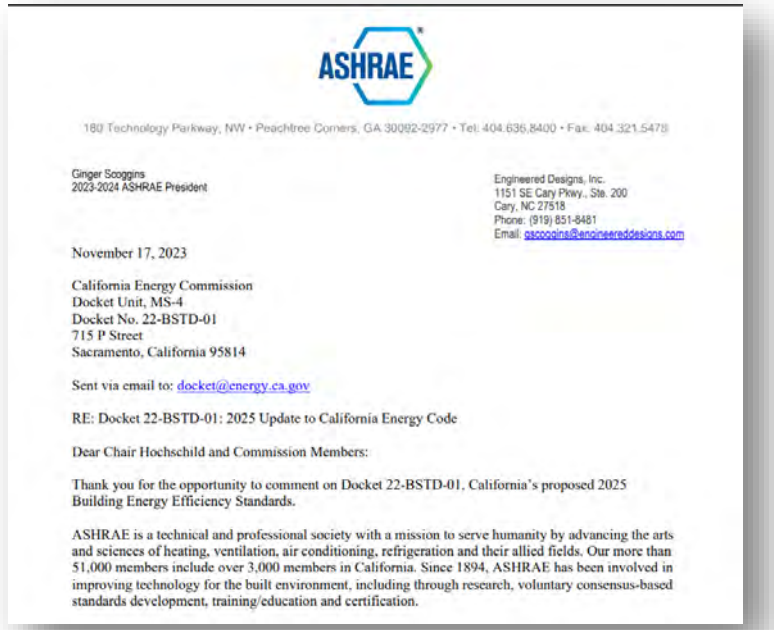
Over 100 Government Outreach Events during the 24-25 SY

GOVERNMENT AFFAIRS UPDATE

BI-WEEKLY NEWSLETTER

Sign up for the Government Affairs Update online or email **GovAffairs@ashrae.org**

LETTERS & TESTIMONY



ASHRAE

180 Technology Parkway, NW • Peachtree Corners, GA 30092-2977 • Tel: 404.636.8400 • Fax: 404.321.5478

Ginger Scoggins
2023-2024 ASHRAE President

Engineered Designs, Inc.
1151 SE Cary Pkwy., Ste. 200
Cary, NC 27518
Phone: (919) 851-8481
Email: gscoggins@engineereddesigns.com

November 17, 2023

California Energy Commission
Docket Unit, MS-4
Docket No. 22-BSTD-01
715 P Street
Sacramento, California 95814

Sent via email to: docket@energy.ca.gov

RE: Docket 22-BSTD-01: 2025 Update to California Energy Code

Dear Chair Hochschild and Commission Members:

Thank you for the opportunity to comment on Docket 22-BSTD-01, California's proposed 2025 Building Energy Efficiency Standards.

ASHRAE is a technical and professional society with a mission to serve humanity by advancing the arts and sciences of heating, ventilation, air conditioning, refrigeration and their allied fields. Our more than 51,000 members include over 3,000 members in California. Since 1894, ASHRAE has been involved in improving technology for the built environment, including through research, voluntary consensus-based standards development, training/education and certification.

Government Affairs

Share your Expertise with Government Officials through the new SMEs for GOEs Program

Policymakers and elected officials need your expertise to make better decisions as they craft legislation and regulations impacting HVAC&R and the built environment.

The Government Affairs Committee (GAC) has developed a new program to identify Subject Matter Experts (SMEs) who can effectively communicate with non-technical audiences such as government officials

BE THE SOURCE of technical expertise for these decisions!

Sign up online or email GovAffairs@ashrae.org

RP and ASHRAE Foundation: Supporting ASHRAE's Mission

Projected Amounts for Society Year ending June 30, 2025

$2.7M Research Promotion Campaign
(Research, YEA, ALI, Scholarships, General)

$1.95M Raised for Endowments

$218,500 Awarded through
40 Scholarships

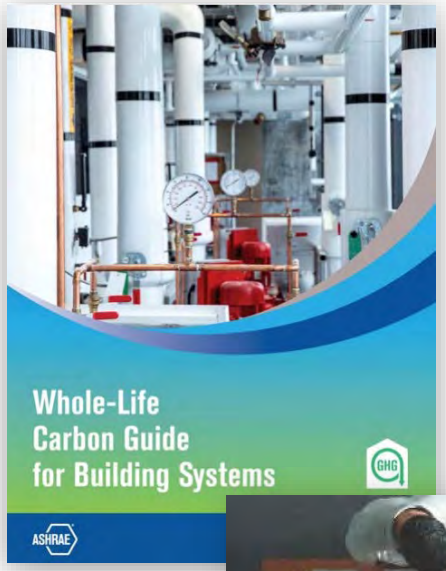
$1.9M Raised for Research

$51,000 Raised by College
of Fellows and Life Members Club

$1.18M Given by ASHRAE
Regions, Chapters and Sections

More than 5,000 contributions from Members, Organizations and other Associations

Center for Excellence in Building Decarbonization (CEBD)



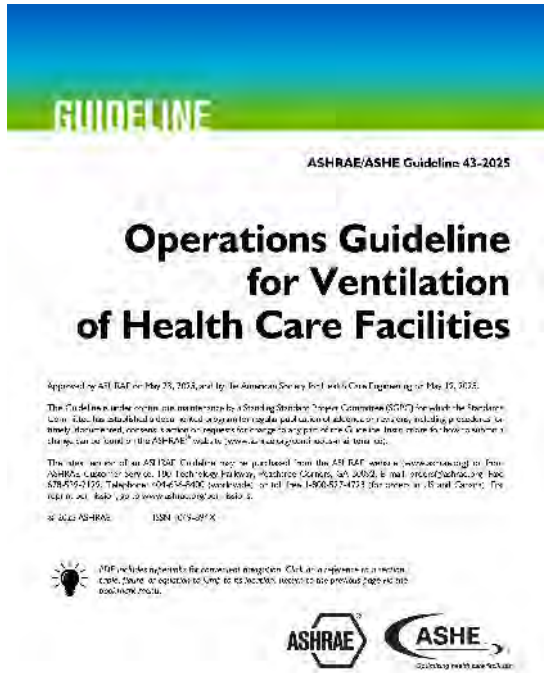
JUST RELEASED!

- **Issued RFPs for two (2) CEBD projects in May**
- **Additional RFPs for CEBD projects to be issued in August**
- **Released two (2) more decarbonization guides**
- **New Decarbonizing Building Thermal Systems eLearning Course**
- **Suite of Decarbonization Guides:**
  - ✓ Grid Interactive Buildings for Decarbonization Design
  - ✓ Decarbonizing Hospital Buildings
  - ✓ TM65 Addendum for North America with CIBSE
  - ✓ Building Decarbonization Retrofits for Commercial & Multifamily Buildings
  - ✓ Decarbonizing Building Thermal Systems: A Guide for Applying Heat Pumps & Beyond with NREL
  - ✓ NEW! *Whole Life Carbon Guide for Building Systems*
  - ✓ NEW! *Guide to Strategic Decarbonization Planning with USGBC*

Standards & Guidelines

New Standards

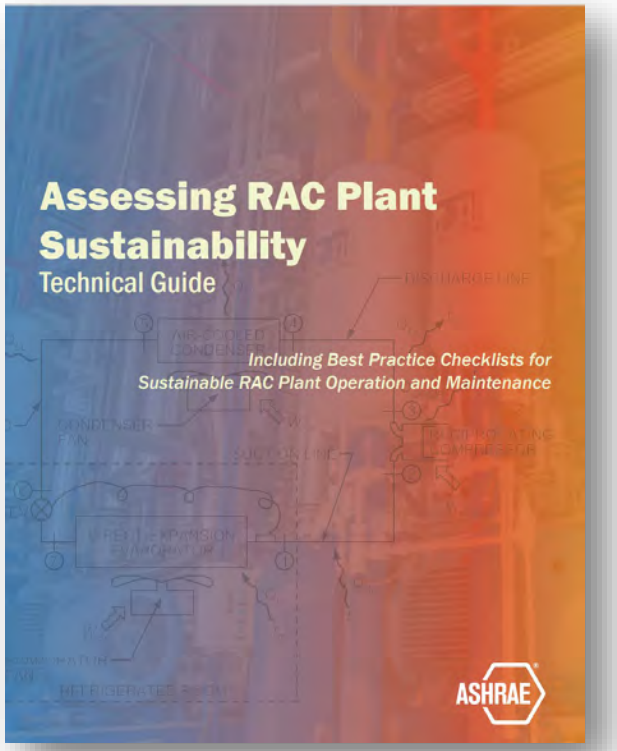
New Guideline

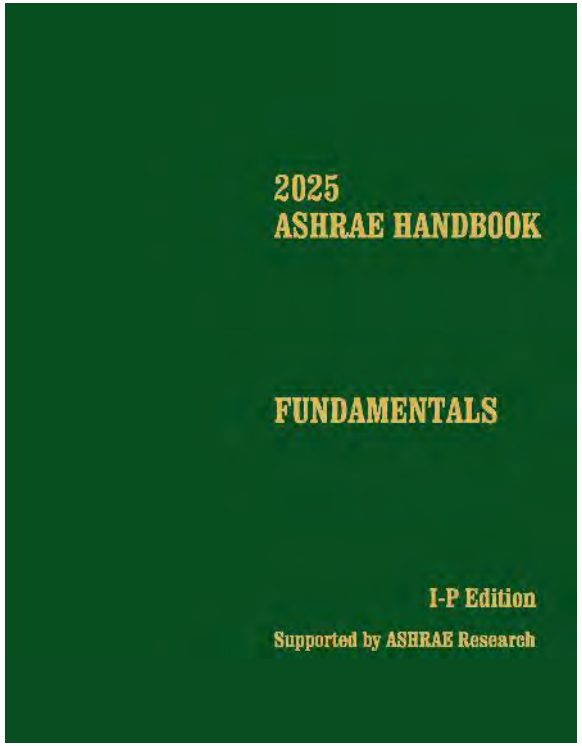


ASHRAE Bookstore

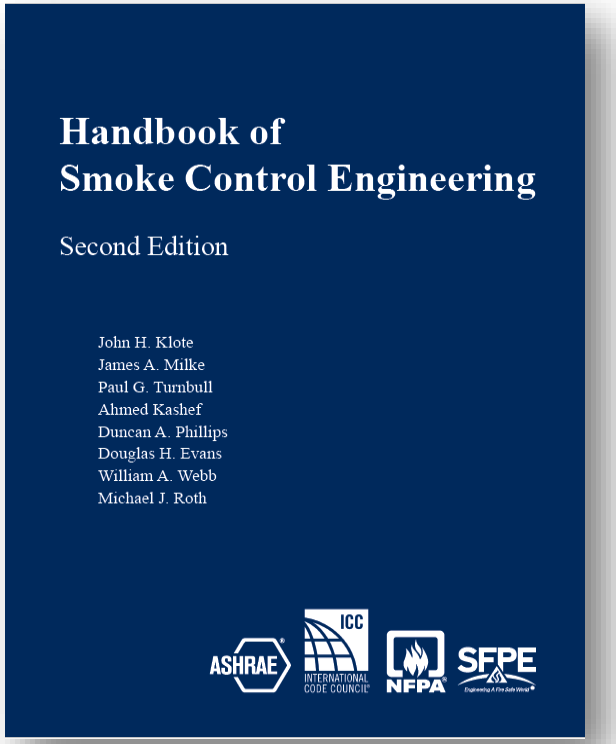
ABOUT | TECHNICAL RESOURCES | PROFESSIONAL DEVELOPMENT | CONFERENCES | COMMUNITIES | MEMBERSHIP

Get the Latest and Greatest Publications





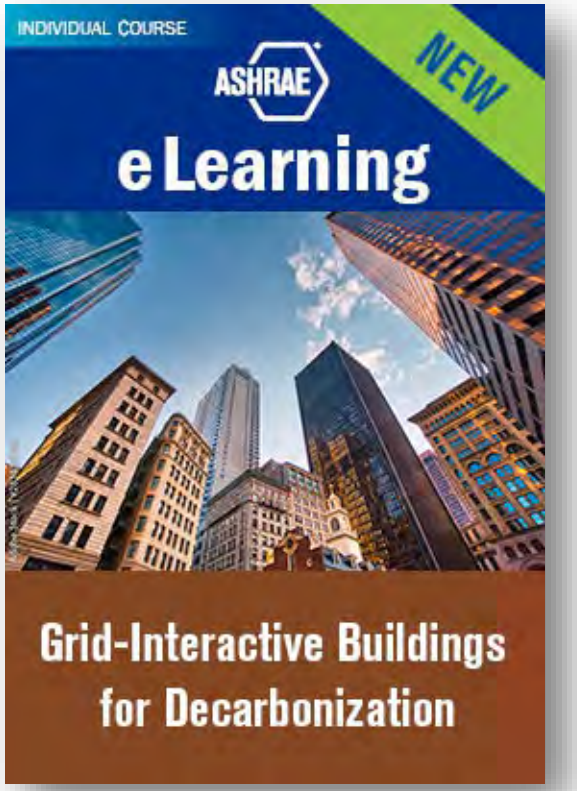
Coming July 1!



Professional Development

eLearning

New Course



ASHRAE Learning Institute

Free Publication

Empowering professionals to advance their careers and the industry.

Certification

New Certification

Near Record Application Total SY 2025

Farr and Setty Family Foundation Funds Scholarships for ALI, AGT, and eLearning Registrants

ASHRAE Members in their **first 5 years** of membership get **35% off** one ALI, AGT, or eLearning course—thanks to support from the Farr and Setty Family Foundation Funds!

- ✓One-time use per Society Year
- ✓Apply 3 weeks before your course
- ✓Must include a chapter officer's support letter

Where to apply? Check the page of the course you're interested for an application.

2025 Conferences

Denver, CO August 13-15, 2025

2025 ASHRAE Conference for Integrated Design, Construction & Operations

Montreal, Canada September 24-26, 2025

IEQ 2025 Conference

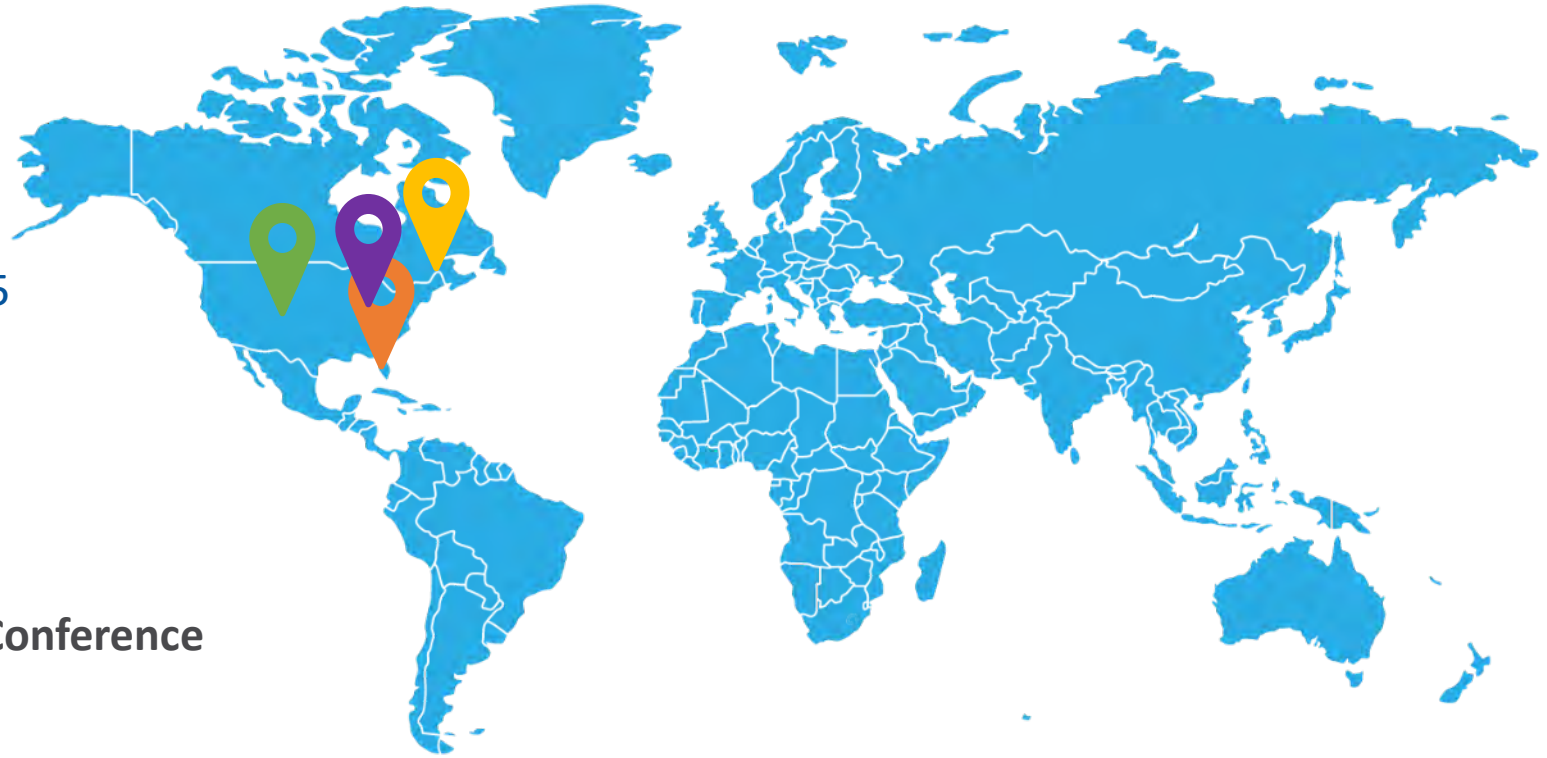
Co-Organized by ASHRAE and AIVC

Chicago, IL October 22-24, 2025

2025 ASHRAE Building Decarbonization Conference

Clearwater Beach, FL December 8-11, 2025

2025 Buildings XVI Conference



2026 ASHRAE Winter Conference

2026 ASHRAE WINTER CONFERENCE

Join us in Las Vegas, NV
Jan 31- Feb 4

Registration Opens in September

Committees and Student Scholarships

Find Committees and Nominate Yourself or Others

FEB 2026 — **February:** Nominations for appointed committees are due.

JUN 2025 — **June:** Speak with your committee ExO/CO if your current appointment/elected position ends to be nominated for another.

SEP 2025 — **September:** Nominations for elected positions are due. (Publications & Education Council, Tech Council, RAC, TAC, Standards, Handbook, Nominating)

Communities > Student Zone > Scholarships

44 Society Scholarships Available for 2025-2026 SY

Each year the ASHRAE Foundation awards scholarships of up to **$12,500** USD each to qualified students.

Spread the word to students and encourage them to apply.

Consider donating to help support the scholarship program.

New! Find the *ASHRAE-USGBC IAQ for Schools Guide* in the Student Zone Resources.

Membership

Have you selected your Annual Membership Benefit?

Benefits are selected during the join & renewal process. If you haven't done so, login and select from benefit options available.

New, Full Dues Paying Members Automatically Get:

HONORS & AWARDS

The following awards have a DEC 1 deadline:

Andrew T. Boggs Service Award | Distinguished 50 and 75-Year | Distinguished Service Award (DSA)| Eunice Foote Decarbonization Award | Exceptional Service Award (ESA)

Louise & Bill Holladay Distinguished Fellow Award

Proposed Change to Membership Model

Associate and Affiliate Member Grades and Smart Start discount program	Replaced with →	**Young Professionals Member Category** 35 years or younger, first 2 years of membership heavily discounted
Developing Economies discount program	Transitions to →	**Four Tiers of Member Dues** based on country of residence with same benefits across all tiers (aligned with World Bank)
Retired Member category	Replaced with →	**Tenured Professional Member Category** 65 years or older + 25 years of membership heavily discounted to mirror Young Professional
Life Member Grade	Transitions to →	**Life Service Member Grade** 65 years or older + 30 years of membership + qualification of service to Society

Benefits: All Members, even Students, receive access to Handbook Online. Members receive additional annual benefit option
Member Qualifications: Broadened to be more inclusive of anyone interested in the Building Sciences industry

Current Model

Full Member Grade

Full Member	Fellow Member *	Full Member DE	Retired Member	Retired Member DE	Life Member	Presidential Member
100% ($285)		60% ($170)	15% ($45)	50% of RM ($25)	$0	
12 years combined experience for post high ed, work, pro engineering reg/license *Good standing for 10+ yrs & elected by BOD			Retired from active participation in business + 10 yrs membership + ≥ 55		30 yrs cumulative member + ≥ 65	Served as Society President
Full Benefits: Subscription to HPB, Journal, Insights + Choice of 1 annual benefit + Tech Portal + Member pricing on publications, standards, courses and conferences		**Benefits:** Same as Full except subscription to **digital** Journal and Choice of 1 annual benefit: HB PDF, 1 STD or GDL or eLearning Course	**Benefits:** Same as Full Member except NO choice of annual benefit.		**Benefits:** Same as Full Member + waived dues, extreme discounts to W&A Conferences. Invitations to VIP events (Presidential only)	
Additional New Member Benefits: Receive a Comp Winter or Annual Conference to attend in first 2 years + HBO access for 1 year						

Current Model continues onto next page

Associate Member Grade

Associate Member	Associate Member DE	Smart Start Associate Member	Smart Start Associate Member DE	Life Member
100% ($285)	60% ($170)	FY 10% ($30) SY 37.5% ($105) TY 50% ($145)	FY 10% of DE ($15) SY $37.5% DE ($65) TY 50% od DE ($85)	$0
Work experience and interest in design, operation, maintenance in HVAC&R		3 yr program that allows Students to transfer to Associate grade at a rate that is recent graduate friendly		Associate Member 30 yrs cumulative member + ≥ 65
Full Benefits: Subscription to HPB, Journal, Insights + Choice of 1 annual benefit + Tech Portal + Member pricing on publications, standards, courses and conferences *DE Associate and Smart Start have same benefits as Full Member DE				**Benefits:** Same as Full Member + waived dues, extreme discounts to W&A Conferences + Invitations to VIP events
Additional New Member Benefits: Receive a Comp Winter or Annual Conference to attend in first 2 years + HBO access for 1 year *Associate DE and Associate Smart Start DE not eligible*				

Current Model - Continued

Affiliate Member Grade

Affiliate Member	Affiliate Member DE
FY 25% ($70) SY 37.5% ($105) TY 50% ($145)	FY $25% of DE ($45) SY $37.5% DE ($65) TY 50% of DE ($85)

30 years old OR have been honorably discharged from the Military within 5 yrs

Subscription to HPB, Journal & Insights + Tech Portal + Member pricing for publications, courses, standards and conferences

Cannot hold office or vote

Student Member Grade

Student Member	Student Member DE	Student Branch Advisor
10% ($30)	50% of Student Member ($15)	10% ($30)

Studying or have interest in HVAC&R industry related field + Must be currently enrolled in university, college, junior college or technical institute

Faculty member who is ASHRAE member & must submit application and submit annual report

Subscription to HPB, Journal & Insights + Tech Portal + Student Member pricing for publications, courses, standards and conferences + Access to Student Bookstore for heavily discounted publications and printed HB

Cannot hold office or vote

Other

Honorary Member
$0

Any notable person of preeminent professional distinction & elected by the BOD

Full Member Benefits if requested

Simplified Model

Member Grade					Student Member Grade		Other
Member	Young Professional	Tenured Professional	Life Service Member	Presidential Member	Student Member	Student Branch Advisor	Honorary Member
WB Tier 1 100% ($285) WB Tier 2 80% ($230) WB Tier 3 60% ($170) WB Tier 4 40% ($115)	40% ($115)		$0		7.5% ($20)	20% ($60)	$0
Anyone interested in the building sciences industry	Anyone ≤ 35 yo who joins pays this fee first for 2 years	Anyone ≥ 65 yo with 25 years cumulative member-ship	30 yrs cumulative member + ≥ 65 + DSA or 15 qualifying service points	Served as Society President	Must be currently enrolled in university, college, junior college or technical institute	Faculty member who is ASHRAE member & must submit application and submit annual report	Any notable person of preeminent professional distinction & elected by the BOD
HBO + Journal, HPB, Insights + Tech Portal + Member Pricing + Voting Privileges and Serve as C,R,S level roles Choice of 1: eLearning Course, Certification Study Guide, Standard or Guideline	HBO + Journal, HPB, Insights + Tech Portal + Member Pricing		Same as Member + waived dues, extreme discounts to W&A Conferences. Invitations to VIP events (Presidential Only)		Same as Young and Tenured Professionals		Full Member Benefits if requested

Additional New Member Benefits:
Receive a Comp Winter or Annual Conference to attend in first 2 years + HBO access for 1 year

*2025-2026 approved dues rates

Simplified Model Highlighted Changes

Associate and Affiliate Member Grades and Smart Start discount program	Replaced with →	**Young Professionals Member Category** 35 years or younger, first 2 years of membership heavily discounted
Developing Economies discount program	Transitions to →	**Four Tiers of Member Dues** based on country of residence with same benefits across all tiers (aligned with World Bank)
Retired Member category	Replaced with →	**Tenured Professional Member Category** 65 years or older + 25 years of membership heavily discounted to mirror Young Professional
Life Member Grade	Transitions to →	**Life Service Member Grade** 65 years or older + 30 years of membership + qualification of service to Society. Members who don't qualify are eligible for discounted Tenured Professional category.
Student Branch Advisor dues rate	Increases to →	**20% of Full Dues** SBAs would go from paying the same rate as Students (10% - $30) to paying slightly more at 20% of dues (currently $60). SBAs would still receive Student pricing to W&A Conferences, the same benefits and access to Handbook Online.

Benefits: All Members, even Students, receive access to Handbook Online. Full Members receive additional annual benefit option.
Member Qualifications: Broadened to be more inclusive of anyone interested in the Building Sciences industry

Reasons for the Changes

Simplification

Support Diversity, Equity and Inclusion

- Young Professionals mirrors Tenured Professionals
  - Same benefits and same dues rate
- Lift Member qualifications and restrictions
  - All members (except Students) can vote
  - All members (except Students) can hold C,R,S roles
  - Anyone interested in building sciences can join ASHRAE

Tiered Member Dues match all four Tiers of World Bank

- Motion from Region-at-Large CRC Lebanese Chapter
- Motion from Region VIII CRC Monterrey Chapter

Added Benefit for ALL Members including Students: HBO

- Motion from Region VIII Central OK Chapter — MP & SAC
- Motion from Region XI CRC Southern Alberta Chapter — MP

Access to HBO serves as retention tool

- When 12-month subscription to HBO ends, member will renew to gain access instantly
- Access for students to HBO gives incentive for joining as a Young Professional to keep access

Slowing the continued growth of Non dues paying Life Members

- Rewards those who have served Society through different channels with waived dues
- Allows members who have 30 years of membership and age 65 or older with significantly discounted dues rate to maintain HBO, Journal and Member Pricing

Recommended Timeline

- **February 2025:** MMAH brought motion to the Board of Directors to approve plan.
  - Motion tabled to allow for 60-day "cooling off period."
- **May BOD Meeting:** BOD approved the final plan and bylaws amendment.
- **2026 Winter Conference:** Bylaws amendment read at the Meeting of the Members (Saturday Plenary Session) in Las Vegas.
- **Spring 2026:** Proposed Bylaws amendment added to Spring Ballot for membership vote
- **June 2026:** Election
- **By June 30, 2027:** If Bylaws amendment are approved, all changes made to membership database, website, promotional materials, ROB, Committee/Council MOPs and training materials. *(Staff and Members Council will need 1 year to implement new model changes)*
- **July 1, 2027:** New model implemented.

Questions? Contact members@ashrae.org

Media Inquiries

Asked to make a statement on behalf of ASHRAE?

Please send all media inquiries to publicrelations@ashrae.org before responding to members of the press.

Thank you!
Questions or Comments?

ashrae.org