



Shaping Tomorrow's Global
Built Environment Today

MINUTES
GOVERNMENT AFFAIRS COMMITTEE
SPRING MEETING
WEDNESDAY, APRIL 8, 2026
9:00 AM – 11:00 AM EDT
~Virtual Meeting~

Minutes approved at the GAC Annual Meeting – June 26, 2026.

1. Call to Order, Welcome, and Roll Call - Meghan McNulty called the meeting to order at 9:01 a.m. EDT and welcomed the meeting attendees. Attendance was taken (see below). A quorum was present.

ATTENDANCE

Members Present

Meghan McNulty,
Chair
Mick Schwedler,
Vice Chair
Keith Reihl
Doug Fick
PJ Johnston
Andy Persily
Matt Catan
Adrienne Mitani
Patrick Adams Villaume
Harrison Kesling
Victor Niño
Doug Cage
Eleazar Rivera
Jessica Renner
Alexander Armstrong
Geoff Jenks
Luis Alvarado
Varun Jain
Abdallah Mahmoud
Brad Lentz
Rob Craddock

Members Absent

Megan Tosh
Dennis Knight
Artorius Reyes
Adam Doubblestein
Syed Mubarak
Ioan Dobosi
Ashish Rakheja

Staff

Alice Yates
Bryce Causey
Neil Gavigan
Jacob Karson
Chris Miller
Emily Porcari
Jeff Littleton

Guests

none

2. ASHRAE Value Statement - McNulty read the value statement and referenced the hyperlinks.

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 - <https://www.ashrae.org/about/governance/code-of-ethics>

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

Diversity Statement - <https://www.ashrae.org/about/diversity-equity-and-inclusion-dei>

3. Review of Agenda - McNulty reviewed the agenda, and it was accepted as written.
4. Approval of Minutes from January 30, 2026 Meeting – McNulty asked for approval of the minutes from the January 30, 2026 meeting (See Attachment) by acclamation. They were approved; no objections.
5. Update on Action Items – Alices Yates reviewed the Action items (See Attachment) and noted that #10 was added after the GAC Executive Subcommittee since it was an item that should receive input from the full committee.
6. Subcommittee Reports and MBO Status Reports (See Attachment)
 - a. Executive Subcommittee – McNulty provided an update on the Subcommittee’s MBOs and activities.
 - i. MBO Update – McNulty referenced the updates provided in the attached table.
 - ii. Governing Documents
 1. Resource Manual – updates/revisions – Mick Schwedler stated that he and Doug Fick are doing a review of the Resource Manual and are aiming to complete it by May 1. Yates noted that RVC input would be highly appreciated and shared the Basecamp links to access the documents.
 - iii. Revised PPIBs – McNulty asked for two consent motions per the Attachment (with background, fiscal and staff impact). Schwedler explained how consent motions work and asked if anyone wanted to pull any of the PPIBs out of either consent motion. Andy Persily requested that the ETS and ENDS, IAQ, and Indoor CO₂ PPIBs be considered separately (all from Group 2).

MOTION #1 (Revisions to Existing Public Policy Issue Briefs—GROUP 1): That the Government Affairs Committee approve the attached revisions to existing PPIBs listed under GROUP 1, per the attachment.

MOTION#1 PASSED: Approved by acclamation, with McNulty abstaining.

MOTION #2 (Revisions to Existing Public Policy Issue Briefs—GROUP 2): That the Government Affairs Committee approve the attached revisions to the following existing PPIBs:

- Building Decarbonization
- Refrigerants

MOTION#2 PASSED: Approved by Voice Vote; Meghan McNulty and Patrick Villaume abstained.

MOTION #3 (Revisions to Existing Public Policy Issue Briefs—ETS/ENDS PPIB): That the Government Affairs Committee approve the attached revisions to the Environmental Tobacco Smoke and Electronic Nicotine Delivery Systems PPIB.

AMENDMENT #1 TO MOTION #3: To amend the motion by striking new language in that would make less clear the dangers of secondhand smoke as follows:

“Such exposure ~~is also known as may be called~~ passive smoking ~~and as or~~ exposure to secondhand smoke.”

Moved by Schwedler and seconded by Mitani.

AMENDMENT PASSED: Approved by Voice Vote, Meghan McNulty abstained.

AMENDMENT #2 TO MOTION #3: To strike an erroneous reference to ASHRAE Standards 62.1 and 62.2 related to indoor smoking as follows:

“For example, ANSI/ASHRAE Standards 62.1-2025, *Ventilation and Acceptable Indoor Air Quality* and 62.2-2025, *Ventilation and Acceptable Indoor Air Quality in Residential Buildings* are standards that specify minimum ventilation rates and other measures, ~~including the prohibition of smoking or using ENDS,~~ to manage indoor air quality.”

Moved by Persily and seconded by Mitani.

AMENDMENT PASSED: Approved by Voice Vote, Meghan McNulty abstained.

AMENDED MOTION #3: To approve revisions, including two approved amendments, to the ETS/ENDS PPIB. Moved by Persily and seconded by Mitani.

AMENDED MOTION #3 PASSED: Approved by Voice Vote; Meghan McNulty abstained.

MOTION #4 (Revisions to Existing Public Policy Issue Briefs—Indoor CO₂ PPIB): That the Government Affairs Committee approve the attached revisions to the Indoor CO₂ PPIB.

AMENDMENT #1 TO MOTION #4: To change the citation in the 2nd footnote to ASHRAE's Position Document on Indoor CO₂. Moved by Persily and seconded by Fick.

AMENDMENT PASSED: Approved by Voice Vote, Meghan McNulty abstained.

AMENDED MOTION #4: to approve revisions to the Indoor CO₂ PPIB, as amended. Moved by Persily and seconded by Fick.

AMENDED MOTION#4 PASSED: Approved by Voice Vote, Meghan McNulty abstained.

IAQ PPIB

In the interest of time, further discussion and approval of the IAQ PPIB was tabled. Revisions on this document will be discussed and recommendations made by Persily, Mitani, and Neil Gavigan, and anyone else who wants to join the discussion. (Action Item)

- b. Policy and Programs Subcommittee - Adrienne Mitani provided updates:
 - i. MBO Update - Mitani referenced the updates provided in the attached table (See Attachment).
 - ii. SMEs for GOE Program – Mitani stated the program has been used for the first time for an **in-person** event. Evaluation of and recommendations for the program are ongoing.
- c. Member Mobilization Subcommittee - Eleazar Rivera-Mata provided updates:
 - i. MBO Update – Rivera referenced the updates provided in the attached table (See Attachment).
 - ii. GOEs Status Update – Rivera provided updates on GOEs for the SY. Jacob Karson gave additional context on GOE reporting form changes that should make reporting easier.
 - 1. PAOE Points for GOEs - There was discussion on why a multi-meeting DOTH should only get 50 points. After reviewing the language in the PAOE, it seemed clear this was not the case as the points are to be awarded per meeting. To document this understanding, a motion was offered.

PAOE MOTION: That the GAC interpret GA18 as being 50 points per meeting, including for multiple discrete meetings that take place at a multi-meeting GOE, at a cap of 800 points per multi-meeting GOE. Moved by Geoff Jenks seconded by Patrick Villaume.

MOTION PASSED: Approved by Voice Vote; no opposition; McNulty abstained.

- d. Global Affairs Subcommittee - Luis Alvarado provided updates:
 - i. MBO Update – Alvarado referenced the updates in the attached table.

7. Reports

- a. ExO Report – Rob Craddock did not give a report as he needed to leave the meeting early.
- b. Communications Coordinator Report – Brad Lentz had reported earlier that he was unable to attend this meeting; no report was provided.
- c. Technology Council Representative Report – Doug Fick provided a written report (See Attachment), and discussed the recent work of relevance to GAC by the Technology Council.
- d. Members Council Representative Report -Keith Reihl reported on the ongoing reviews of documents and that folks should email him on any proposed changes. He referenced Action Item #10:

Reviews of Documents – Input from RVCs requested by May 1

- 1. Manual of Chapter Operations – GovAffairs Section
- 2. Reginal Operations Manual
- 3. CRC Manual

- e. Pub-Ed Council Representative Report – Megan Tosh was absent and did not give a report.

- 8. Other Business – McNulty asked if there was any other business, and nothing was brought to the committee.
- 9. Review of New Action Items added at this meeting – Yates reviewed the new action items added during this meeting (See Attachment).
- 10. Next Meeting -McNulty stated that the next meeting will occur on June 26, at the Annual Conference in Austin, TX.
- 11. Adjourn – McNulty adjourned the meeting at 11:01 a.m. EDT.

*Minutes Respectfully Submitted by Alice Yates, Staff Liaison,
with support from Chris Miller and Neil Gavigan.*



Shaping Tomorrow's Global
Built Environment Today

DRAFT MINUTES

**GOVERNMENT AFFAIRS COMMITTEE
WINTER CONFERENCE**

**FRIDAY, JANUARY 30, 2026
1:00 PM – 5:00 PM PST
CAESARS PALACE**

ATTENDANCE

Members Present

Mick Schwedler, Acting
Chair 2026 Winter
Conference
Doug Fick
Keith Reihl
Megan Tosh
Brad Lentz
PJ Johnston
Andy Persily*
Artorius Reyes
Matthew Catan
Adrienne Mitani
Patrick Adams Villaume
Harrison Kesling
Victor Niño*
Doug Cage
Eleazar Rivera
Jessica Renner
Alexander Armstrong
Geoff Jenks
Luis Alvarado
Syed Mubarak*
Ioan Dobosi
Varun Jain
Abdallah Mahmoud
Rob Craddock
Ashish Rakheja

Members Absent

Meghan McNulty, Chair
Dennis Knight

Guests

Georgios Pantelidis
Tobi Showunmi
William Bahnfleth
Matthew Archey
Darryl Boyce
Kazukiyo Kumagai
Brittany Swan - AMCA
Dwayne Taylor
Scott West
Walt Vernon
Colin Laisure-Pool
Martin Luymes - HRAI
Carolyn McCoy
Ng Yong Kong
Arturo Thur de Koos
Pat Marks
Joe Muchynski
Matt Price
Tracee Rhodes
Clay Nesler
Elizabeth Becker
Steven Dimino
Erony Martin
Sherry Abbott-Adkins
Dwayne Taylor
Sarah Maston
Eric Hall
Nicoletta Kaba
Money Khanna

Staff

Alice Yates
Bryce Causey
Neil Gavigan*
Jacob Karson
Chris Miller
Emily Porcari

Guests (continued)

Rafi Michel
Lisa Ng
Nicole Colantonio
Tom Deary
Raj Setty
Charlie Reifenberger
Julia Timberman
Matt Walters
Leigh Lain Walker
Ali Zahedi
Constanza Molina
Marcus Hassen
Carrie Brown
Chrysostomos Bouras
Ahmol Prabhu
Ricardo Arellano
Walt Vernon
Raajesh Murugesan
Peter Turk
Jaganraj Rathinam

*Indicates Remote Participation

1. Call to Order, Welcome, Roll Call, and Announcements – Mick Schwedler called the meeting to order at 1:00 p.m. PST and welcomed the meeting attendees. Attendance was taken (see above). A quorum was present. Schwedler then read a prepared message from GAC Chair Meghan McNulty: *The U.S. Department of Energy determined that national lab employees cannot participate in this ASHRAE conference in Las Vegas. So, sadly I will not be attending our GAC meetings. Mick, as Vice-Chair, will lead the meetings in my place. I hope you all take some time at this meeting to connect with GAC friends old and new, and I wish everyone a fun and productive conference.*
2. Guest Introductions – Schwedler asked the guests in the room to introduce themselves.
3. ASHRAE Value Statement – Schwedler read the value statement and referenced the hyperlinks.
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 - <https://www.ashrae.org/about/governance/code-of-ethics>
Core Values - <https://www.ashrae.org/about/ashrae-s-core-values>
Diversity Statement - <https://www.ashrae.org/about/diversity-equity-and-inclusion-dei>
4. Review of Agenda – Schwedler reviewed the agenda, and it was accepted as written.
5. Approval of Minutes from October 23, 2025 Meeting – Schwedler asked for approval of the minutes from the October 23, 2025 meeting (See Attachment) by acclamation. They were approved; no objections.
6. Update on Action Items - Alice Yates reviewed the action items (See Attachment) and noted that all the Action items except for #1 had been completed.
7. Report from ASHRAE Government Affairs Office: Staff provided a brief report on the policy outlook and opportunities for outreach.
8. Subcommittee Reports and MBO Status Reports
 - a. Executive Subcommittee -Schwedler provided an update on the Subcommittee’s MBOs and activities.
 - i. MBO Update -Schwedler referenced the updates provided in the attached table.

ii. Council Representative Revisions

MOTION: To approve the proposed Council Representative revisions shown in the Attachment.

MOTION PASSED: Approved By Voice Vote (CNV). No objections.

iii. Communications Coordinator Duties

MOTION: To approve the proposed Communications Coordinator revisions shown in the Attachment.

MOTION PASSED: Approved By Voice Vote (CNV). No objections.

- iv. Update on EHC and TC 9.7 Coordination Meetings – Schwedler stated that coordination is going well with EHC, and Doug Fick is working to improve the coordination work with TC 9.7. Schwedler also referenced the IEQ memo with upcoming legislative opportunities on IAQ (See Attachment).
- v. Members Council PAOE Subcommittee– Schwedler thanked members for their feedback and referenced the recommendations submitted to the PAOE subcommittee (See Attachment).

b. Policy and Programs Subcommittee -Adrienne Mitani provided updates:

- i. MBO Update – Mitani referenced the updates provided in the attached table (See Attachment).
- ii. Update on PPIBs – Mitani gave an overview on updates to PPIBs (See Attachment).

Building Electrification – Mitani reviewed the proposed changes to the Building Electrification PPIB approved by PPSC (See Attachment). Mitani moved for a vote to approve the changes. The motion did not need to be seconded.

MOTION: To approve the recommended changes to the Building Electrification PPIB be approved as shown in the Attachment.

MOTION PASSED: Approved By Voice Vote (CNV). No objections.

c. Member Mobilization Subcommittee - Eleazar Rivera-Mata provided updates:

- i. MBO Update – Rivera referenced the updates provided in the attached table (See Attachment).
- ii. GOEs Status Update – Rivera provided updates on GOEs for the SY. (See Attachment)
- iii. GOEs: Year in Review Video – Rivera showed a brief video of GOEs from SY24-25. Rakeja asked that photos be added from the meeting with the Romanian Ambassador (this was added as an action item).

d. Global Affairs Subcommittee - Luis Alvarado provided updates:

- i. MBO Update – Alvarado referenced the updates in the attached table (See Attachment).

- ii. Input to the CEBD on the ASHRAE Building Codes Strategy Game – Yates provided a brief update, stating that the term “Game” has been removed from the name. This project is complete and is available online; the CEBD is available to help share it with governments outside the U.S.

https://www.ashrae.org/file%20library/about/cebd/ashrae-bcat_facilitation-guide_v1.0_20-jan-2026.pdf

Clay Nesler from the CEBD gave updates on the recent workshops on international code adoption, development, and scoping. Nesler also noted that if the GAC wants presentations in additional countries to please contact him.

- Kenya workshop - included national stakeholders, and international partners such as the WRI, The World Bank, and IFC. – went very well, with many government officials in attendance
- Beirut, Lebanon
- Philippines (planning in progress)
- Brazil (planning in progress)

- iii. UNEP Project: OzonAction ASHRAE Connect - Alvarado reported that the subcommittee reviewed the UNEP/ASHRAE Connect Update for GASC members who could not attend the GASC fall meeting, including takeaways from the pilot program which included the value of relationship building as a result of pilot program engagement.

- e. Nominating – Schwedler reported that the Subcommittee will submit its confidential recommendations soon and explained the process for submitting Society-level nominations with a deadline of **Feb. 13, 2026**. Application and process details can be found here:

<https://www.ashrae.org/communities/committees/committee-nominations>

- 9. Government Affairs Award Nomination – An executive session was held to discuss this award nomination.

- 10. Reports from Regional Vice Chairs - Written Reports were provided by all the Regional Vice Chairs (See Attachments):

- | | |
|---------------------------------|--------------------------------|
| • Region I – Matthew Catan | • Region XV – Varun Jain |
| • RAL – Abdallah Mahmoud | • Region V – Adam Doubblestein |
| • Region XIII – Syed Mubarak | • Region XIV – Ioan Dobosi |
| • Region IX – Jessica Renner | • Region XI – Geoff Jenks |
| • Region III – Patrick Villaume | • Region XII – Luis Alvarado |
| • Region II – Adrienne Mitani | • Region VII – Doug Cage |
| • Region IV – Harrison Kesling | • Region VI – Victor Nino |

- Region VIII – Eleazar Rivera

- Region X – Alexander Armstrong

11. GAC PHOTO – Photos of the current GAC members were taken by a professional photographer. Staff will distribute these when they become available.

12. Reports

- a. ExO Report – Rob Craddock provided a report highlighting major Society news and updates – (See Attachment).
- b. Communications Coordinator Report – The Communications already provided his report through the Executive Subcommittee and the proposal to modify the MOP.
- c. Technology Council Representative Report - Doug Fick gave a report (See Attachment), noting that EHC is working on a draft response addressing PFAS.
 - i. RBC Stakeholders Workshop (regarding consumer choice and affordability, resilience, and indoor environmental quality). – Fick stated that the December workshop had 3 breakout sessions on key issues (see attached report). [Alice to add.]
 - ii. Next-Gen Refrigerants Ad-Hoc – Yates stated that a new Ad-Hoc has been formed to address how to safely use A3 refrigerants.
- d. Members Council Representative Report - Keith Reihl reported that Members Council is updating the Chapter Manual of Operations; he asked GAC members to review the GAC section and provide feedback and edits by this fall (this was added to the Action Items).
- e. Pub-Ed Council Representative Report - Megan Tosh stated Pub-Ed will be meeting next week and she will have a report after that meeting.

13. Reports from Other Committees

- a. Young Engineers in ASHRAE – Rafi Michel reported on upcoming YEA Events.
- b. EHC - Bill Bahnfleth, Chair of the EHC Policy and Advocacy Subcommittee reported that a PFAS emerging issue brief is being drafted, and they have been working on a variety of IEQ legislative with the GAC and GA staff.
- c. TC 9.7 - Raj Setty, Chair discussed a two-part project they are working on concerning IAQ legislation focused on schools.
- d. Center of Excellence for Building Decarbonization – Leigh Lain Walker, Staff Liaison to CEBD stated how they are being more strategic now, how the CEBD website has a lot of new information and resources.

14. Guest Reports – reports were provided by a wide range of external organizations:

- a. Air-Conditioning, Heating, and Refrigeration Institute (AHRI) - Tom Deary, Director of Codes

- b. Building Owners and Managers Association (BOMA) – Steve Dimino, Manager of Advocacy and Codes
- c. Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI) – Joe Muchynski, Board Chair and Martin Luymes, Vice President, Government & Stakeholder Relations
- d. Blueprint Biosecurity – Carolyn McCoy, Senior Policy Analyst
- e. ONE Gas - Tracee Rhodes, Manager, Public Policy
- f. AMCA - Brittany Swan, Regulatory Affairs Analyst
- g. GBI – Marcus Hassen, Member of GBI’s Board of Directors (and chair of ASHRAE SSPC 90.4) – see Attachment
- h. SMART/NEMI - Eric Hall, Western Region Representative

15. Other Business

- a. Planning Committee (PLC) Emerging Technologies Ad Hoc – PLC created a new report (See Attachment) that may be of interest to GAC members.
 - b. Restructuring of Members Council – Schwedler reviewed showed a slide with the proposed restructuring (See Attachment).
 - c. Complimentary Committee Meeting Registration for TC/PC/SC Members – Schwedler referenced proposed changes regarding complimentary registrations (See Attachment).
 - d. WISE - Washington Internship for Students of Engineering – (See Attachment) – Yates spoke regarding the WISE Internship, which is still accepting applications. Yates also mentioned how ASHRAE Presidential Member, Sheila Hayter was a former WISE Intern.
16. Review of New Action Items added at this meeting – Yates reviewed the new action items added during this meeting (See Attachment).
17. Next Meeting – Schwedler stated that the next meeting would occur virtually sometime in March or April 2026.
18. Adjourn – Schwedler adjourned the meeting at 4:59 p.m. PST.

*Minutes Respectfully Submitted by Alice Yates, Staff Liaison, with support from
Chris Miller*



**ACTION ITEMS
GOVERNMENT AFFAIRS COMMITTEE
SY 2025-2026**

Last Updated: April 3, 2026

#	Action	Assigned To	Due Date	Status	C/O
<i>Continued from SY2024-25</i>					
1	Create video to show how to fill out and submit a GOE form. This video will be imbedded in the CRC GAC Training as well as the GOE training.	Staff (Karson)	Summer 2025	Completed and posted to the GovAffairs Advocacy Toolkit webpage: https://www.ashrae.org/about/government-affairs/member-resources-advocacy-toolkit	C
<i>Added at Oct. 23, 2025 Fall Meeting</i>					
2	Share advocacy resources (trainings and accompanying slides, presentations, collateral packets) with the EHC advocacy subcommittee	Staff	ASAP	Yates sent to EHC on 10-23-2025.	C
3	Send poll to GAC members to ask about dinner preferences for the Winter meeting in Vegas (close to hotel @ approx. \$100 dinner costs vs. 15-minute uber drive from hotel @ approx. \$60 dinner costs)	Staff	ASAP	Miller sent poll on 10-24-2025.	C
<i>Added at Jan. 30, 2026 Winter Meeting</i>					
4	Work with GASC to recommend one Region for a concentrated government outreach program (and recommend any financial requirements needed to carry out the program); this region could be used as a demonstration for other international regions.	Luis	June 2026	Discussion with GASC chair on this item is ongoing.	O
5	Add photos from Romanian Ambassador meeting to the next "year in review" GOE video.	Staff (Jacob)	Fall 2026	In Progress - Staff is compiling photos, including the meeting with Ambassador Gitman, to use in this year's EOY video.	O
6	Draft a motion to add the award criteria and scoring mechanism for the Gov Affairs Society-level award to the Resource Manual.	Staff (Emily)	Spring mtg	In Progress.	O



#	Action	Assigned To	Due Date	Status	C/O
7	Share with the GAC the Building Code Assessment Tool (BCAT) developed by the CEBD. This tool could be used in your region, as the CEBD could help in hosting a BCAT workshop in your region. https://www.ashrae.org/technical-resources/cebd-center-of-excellence-for-building-decarbonization	Staff	ASAP		C
8	Include Planning Committee Emerging Technologies document (agenda item #15-a) in the Winter 2026 Meeting minutes.	Staff	Mid-Feb.		C
9	Develop a chapter-generic template/documentation to facilitate encouraging chapter members to attend DOTH events.	Staff (Jacob)	Feb.	In progress – The Marketing Department has created a ‘frame’ for LinkedIn posts and a template flyer for chapters to use to internally advertise GOEs. Staff to distribute these new resources, add them to training files, and write SOP.	O
<i>Added after March 16 GAC Executive Subcommittee Meeting</i>					
10	Review the Govt Affairs section of the Manual of Chapter Operations, and make any suggestions; please send suggestions to GovAffairs@ashrae.	All RVCs	Spring 2026 (Note: updated deadline)	This action item has been expanded to additional documents: - Manual of Chapter Operations – GovAffairs Section - Reginal Operations Manual - CRC Manual These documents will be sent out soon (through Keith Reihl) – and please note the change in the due date.	O

Status Update for GAC MBOs SY2025- 2026

Last Updated: 04-03-2026

#	MBO	Subcommittee Assigned	Metric(s)	Status Update
1	MBO #1: Incentivize members to follow up with government officials after GOEs Completion date: 6/30/2026	Member Mobilization	 Recommend additional PAOE points for following up with government officials after a GOE • Develop process for follow-up actions from GOEs and incorporate into GOE training. • Develop at least one recommendation that would encourage follow-up with government officials.	Completion %: 33% Metric #1 is complete. Discussions on additional recommendations to encourage follow-up with government officials will continue in future Subcommittee meetings.
2	MBO #2: Improve forms for GOE reporting and GAA nominations to increase submissions. Completion date for GAA activities: 09/15/2025 Completion date for GOE activities: 1/31/2026	Member Mobilization	 Identify ways to make GOE reporting form and Award nomination process simpler, shorter, or easier to complete, and revise for use this SY.  Create short video showing how to fill out the revised GOE reporting form. • Create video showing how to prepare a nomination for the Government Affairs Award.	Completion %: 67% GA Award deadline has been changed and nominations for this year's award have been evaluated by the Judging Panel. The Judging Panel has used new numerical scoring criteria and a new evaluation process this year to help provide more detailed guidance for Panel members on how to conduct their evaluations than is included in the GAC governing documents. A motion will be proposed this spring to add the new criteria and process to the GAC Resource Manual. The videos on the Award will be completed by staff; target date needs to be adjusted to April or May.

#	MBO	Subcommittee Assigned	Metric(s)	Status Update
3	MBO #3: Implement and improve SMEs for GOEs pilot program. Completion date: 6/30/2026	Policy & Programs	• Refine SME application process. • Review PPIBs, PPPs, and GOEs, and PPPs to identify expertise needs • Schedule 3 government engagements employing ASHRAE SMEs. • Develop evaluation approach to assess effectiveness of initial engagements and prepare summary report. • If continuation or modification of the program is advised, recommend updates to GAC guiding documents to support continuation or modification of the SME program.	Completion %: 25% • At its last meeting, the SMEs for GOEs task team continued to discuss strategies to grow the program. The program is regularly shared with members during Day on the Hill trainings and included in presentations at various levels. Open action items for the team include: • Create a more refined one pager/dashboard that clearly displays an SME's attributes • Create a plan and template for getting feedback after a GOE at which an SME participates.
4	MBO #4: Consider ways to better inform ASHRAE's technical committees of relevant public policy actions, and to solicit updates from TCs and PCs. Completion date: 6/30/26	Policy & Programs	• Develop at least two recommendations for improving connections between ASHRAE technical committees and public policy actions, such as informing Standards Committees of adoptions and references, and developing a process for getting updates on significant PC and TC actions, as well as model code proposals.	Completion %: 75% Improved collaboration and communication has taken place primarily with EHC and TC 9.7. Updates on legislation referencing ASHRAE Standards have been shared and coordination meetings have taken place. A presentation on government activities has been given at the TC Breakfast in Vegas. The Tech Council OPS Subcommittee, chaired by Doug Fick, has asked Tech Council Committees to review their training materials related to government affairs. They will make sure to include govaffairs@ashrae.org and a simple method to notify GAC whenever a technical committee is planning on government related activities.

#	MBO	Subcommittee Assigned	Metric(s)	Status Update
5	MBO #5: Work with Global Technical Interaction Committee (GTIC) to facilitate sharing of information to avoid duplication of efforts, including through improved understanding of market needs and the tracking and adoption of ASHRAE standards and guidelines around the world. Completion date: 6/30/2026	Global Affairs	 Nominate a liaison from GASC to GTIC and send recommendation to GAC Chair at earliest possible opportunity. - Each member of GASC to provide a list of ASHRAE standards that have been adopted by various jurisdictions in their regions. - Informed by the data above, identify opportunities for ASHRAE Standards adoption, including through scheduling meetings, sharing information about standards, and/or writing advocacy letters for standards adoption.	Completion %: 30% Eleazar nominated as staff liaison from GAC/GASC to GTIC. Initial discussion of how to research and report ASRHAE standard adoption has been held, and a goal on reporting for the SY have been set. RVCs are engaged on identifying and capitalizing on opportunities for ASHRAE internationally via GOEs, letter writing, and advocacy. GASC has determined that it is not capable of the scope/scale required to research standard adoption nation by nation. Opportunities continue to be identified by individual RVCs.
6	MBO #6: Provide recommendations to the full committee on priorities for document translation. Completion date: 6/30/2026	Global Affairs	Develop guidelines for identifying which languages and documents should be prioritized for translation.  Recommend which languages and documents should be prioritized for translation in SY25-26.  Review previously translated documents for necessary updates.  Form work groups to translate priority documents into priority languages.	Completion %: 80% French, Portuguese established as high priority languages for translation. Documents related to IAQ, wildfires, and legionella determined to be the highest priority, with PPIBs a high priority more broadly. ASHRAE standard translation into French is outside our scope, but was cited as a high priority as well. Spanish language translation group agreed to run updates on translated PPIBs on an ongoing basis. PPIB updates provided to Spanish translation team for review. French translation workgroup formation in progress.

#	MBO	Subcommittee Assigned	Metric(s)	Status Update
7	MBO #7: Improve methods for seeking input from ASHRAE members and the Executive Committee on issues to be addressed in the society's public policy priorities. Completion date: 3/31/2026	Executive Subcommittee	 Develop 1-2 new outreach tools for seeking input from members and the Executive Committee. Make sure this outreach is done no later than third quarter of the society year so that it can be considered for revising the PPPs for SY26-27.	Completion %: 95% Subcommittee has developed 3 tools and staff will be working with the Marketing department to implement them.
8	MBO #8: Coordinate with Environmental Health Committee (EHC) on emerging IEQ topics, in alignment with SY25-26 Presidential Theme Completion date: 6/30/2026	Executive Subcommittee	 Hold quarterly meetings with EHC Policy Subcommittee Chair and GAC Chair, VC, and PPSC Chair.  Develop 1-2 recommendations to improve GAC-EHC collaboration and responsiveness to emerging IEQ issues.	Completion %: 85% All quarterly meetings have been conducted or scheduled: • Sept 10, 2025 • Dec 12, 2025 • Feb. 17, 2026 • May 14, 2026 <i>Possible Recommendations:</i> 1. Include CE-IEQ in these coordination meetings so that both operational and strategic issues are addressed [ADD TO MAY 14 AGENDA] 2. Continue to share information on status of PDs and EIBs 3. Pre-review of PPIBs by EHC and CE-IEQ – Adrienne to address whether or not that process would be helpful

#	MBO	Subcommittee Assigned	Metric(s)	Status Update
9	MBO #9: Evaluate feasibility of establishing a “scholarship” fund for public sector workers’ conference attendance through ASHRAE Foundation funding. Completion date: 4/30/2026	Executive Subcommittee	 Determine feasibility, limitations, and costs of a “scholarship” fund to help fund public sector workers’ attendance at ASHRAE conferences. If feasible, complete an ASHRAE Foundation Board of Trustees funding request form to establish program.	Completion %: 90% Subcommittee members are investigating limitations. [Note: Evaluation is tentatively suggesting that this may be broader than GAC; it could be a recommendation/motion to Members Council for consideration – which would then go to the Board.] Keith Reihl investigated with the Foundation, which responded (per Bill Klock) that it doesn’t seem to line up with the ASHRAE Foundation’s primary objectives. This investigation may suggest this is not feasible and then this item would be complete.
10	MBO #10: Recommend changes to PAOE for next SY. Completion date: 9/30/2025	All SCs	 Each SC to develop at least one recommendation to the PAOE.	Completion %: 100% Recommendations from subcommittees have been submitted; this MBO is complete.

#	MBO	Subcommittee Assigned	Metric(s)	Status Update
Notes on ASHRAE 2025-2028 STRATEGIC PLAN: Strategic Goals: 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. Strategic Initiatives: • Healthy, Sustainable and Resilient Communities • Empowered Workforce • Organizational Agility • Emerging Technologies				

PPIB Motions for GAC Spring 2025 Meeting

To approve revisions to the eleven (11) existing Public Policy Issue Briefs (PPIBs), as shown in the attachments. This motion will be taken up through two consent motions.

MOTION #1 (Revisions to Existing Public Policy Issue Briefs—GROUP 1): That the Government Affairs Committee approve the attached revisions to existing PPIBs listed under GROUP 1.

MOTION #2 (Revisions to Existing Public Policy Issue Briefs—GROUP 2): That the Government Affairs Committee approve the attached revisions to existing PPIBs listed under GROUP 2.

BACKGROUND: The PPSC is responsible for annually reviewing existing PPIBs and recommending whether they should be revised, eliminated, or combined. The PPSC recommends keeping all existing PPIBs and updating them as shown in the attachments. There was no opposition.¹

The GAC Executive Subcommittee subsequently approved by letter ballot the updated PPIBs with no opposition.²

To facilitate discussion and voting, the PPIBs are broken into two groups. Group 1 lists PPIBs with only editorial and other minor changes. Group 2 lists PPIBs that were revised with input from the cognizant ASHRAE body. Most of the revisions to the Group 2 PPIBs were also minor. Notable areas of input are summarized below:

- Indoor CO₂
 - EHC advised on the efficacy of CO₂ as a surrogate for indoor air quality and on methods to better track and benchmark CO₂ as it relates to IAQ.
- Refrigerants
 - Doug Riendl (member of SSPC 15 and other refrigerant bodies) commented on areas where A3 refrigerants could be included in the PPIB. PPSC reviewers recommended using more inclusive “lower-GWP” language when referring to both A2L and A3 refrigerants.

Group 1

1. Climate Change
2. Consensus Standards
3. Energy Benchmarking
4. Resiliency
5. STEM and Workforce Development
6. WUI Fires

Group 2

1. Building Decarbonization
2. ETS and ENDS
3. IAQ
4. Indoor CO₂
5. Refrigerants

FISCAL IMPACT: None.

STAFF IMPACT: Minimal—only final edits and production will be needed, as staff time on revisions has already been expended.

¹ In a letter ballot due March 16, 2026 the PPSC approved changes to the 11 existing PPIBs; vote was 7-0.

² In a letter ballot due March 23, 2026, the GAC Executive Subcommittee approved all revised PPIBs 5-0-1 (Note: 3 of the 9 voting members of the Executive Subcommittee did not return ballots by the deadline.)



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BUILDING DECARBONIZATION

THE ISSUE

Buildings benefit society but have a significant worldwide environmental impact including the effects of their greenhouse gas (GHG) emissions. Buildings account for roughly 40 percent of global GHGs, and the global building stock is expected to double by 2060 due to urbanization, population growth, and related economic trends. As governmental bodies and jurisdictions across the planet confront climate change, the term “decarbonization” describes practices or policies that reduce GHG emissions. Building decarbonization may encompass a building’s entire life cycle, including building design, construction, operation, occupancy, and end of life.

Many governmental bodies and jurisdictions require new buildings to be low carbon or net-zero energy in the near term, and other policies are requiring retrofits of existing building stock to decarbonize in the medium to long term. Some decarbonization policies also advance building electrification when coupled with renewable electricity source or other low-carbon technologies. Decarbonization requires large public and private sector investments, leading to job creation and business opportunities in the HVAC&R, construction materials, and design sectors.

ASHRAE's ROLE

ASHRAE stands at the forefront in providing standards, guidance, technical resources, and education for building systems design, manufacturing, installation, and operation. With respect to building decarbonization, ASHRAE’s historical focus has been on energy efficiency, which has resulted in significant GHG emission reductions. ASHRAE is expanding its technical resources, education and training and other initiatives to directly address building decarbonization. ASHRAE's Center of Excellence for Building Decarbonization has numerous resources available at www.ashrae.org/decarb¹

ASHRAE’s relevant consensus-based standards include new proposed standards and those being updated to specifically address building decarbonization such as:

- Standard 90.1-2022, *Energy Standard for Buildings Except Low-Rise Residential Buildings*
- Standard 100-2024, *Energy and Emissions Building Performance for Existing Buildings*
- Standard 105-2021, *Standard Methods for Determining, Expressing and Comparing Building Energy Performance and Greenhouse Gas Emissions*
- Standard 189.1-2023, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*
- Standard 228-2023, *Standard Method of Evaluating Zero Net Energy and Zero Net Carbon Building Performance*
- Proposed Standard 240P, *Evaluating Greenhouse Gas (GHG) and Carbon Emissions in Building Design, Construction and Operation* – for full building lifecycle analysis
- Proposed Standard 242P, *Standard Method for Calculation of Building Operational Greenhouse Gas Emissions*
- Proposed Standard 244P, *Sustainability Assessment for Mechanical, Electrical, and Plumbing Products*

¹ The most up-to-date list can be found at: <https://www.ashrae.org/about/cebd-technical-resources>

ASHRAE's VIEW

ASHRAE's position is that eliminating GHG emissions from the built environment is essential to addressing climate change. To do this, it is ASHRAE's position that:

- Decarbonizing buildings and their systems must be based on a holistic analysis including healthy, safe, and comfortable environments; energy efficiency; environmental impacts; sustainability; operational security; and economics.
- By 2030, the global built environment must at least halve its 2015 GHG emissions, requiring that:
 - all new buildings are net-zero GHG emissions in operation;
 - widespread energy efficiency retrofit of existing assets is well underway, and
 - embodied carbon of new construction is reduced by at least 40 percent.
- By 2050, at the latest, all new and existing assets must be net zero GHG emissions across the whole building life cycle.
- Building decarbonization provides benefits beyond reducing GHGs, including improved indoor and outdoor air quality, improved energy savings, improved community health and wellbeing, enhanced social responsibility, and increased property valuation.
- Operational energy-related GHG emissions can be reduced by implementing efficiency measures; building electrification; improving O&M; improving refrigerant selection and management; increasing use of renewable energy sources both on and off site, energy storage, and building-grid integration.
- Building design and operations should be able to respond to real-time signals from the power grid to reduce GHG emissions.
- Increasing adoption of current energy codes and their effective implementation are critical for decarbonization.
- Whole-building life-cycle assessment must be considered in future building codes to reduce embodied and operational GHG emissions related to buildings and their HVAC&R systems.
- Building performance standards (BPS) should be considered as a policy tool to improve energy efficiency and reduce emissions in existing buildings.
- Decarbonization policies should consider and mitigate impacts such as increased costs on disadvantaged communities and less-developed nations.
- Development of community energy systems, district heating and cooling, and other collaborative approaches that contribute to lower carbon emissions across entire neighborhoods or districts through integrated urban planning such as smart and sustainable cities.
- Collaboration with global organizations, governments, and industry bodies to harmonize standards and policies drive decarbonization across the building sector.
- Training, certification, resources, and tools are needed for building professionals to implement low-carbon design and operations, supporting the workforce transition to sustainable practices.
- Investing in research to support new decarbonization technologies and methodologies, including advancements in renewable energy systems, low-GWP refrigerants, and innovative HVAC design.



Shaping Tomorrow's Global
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CLIMATE CHANGE AND THE BUILT ENVIRONMENT

THE ISSUE

Worldwide concern for changes in the global climate has escalated as scientific evidence has become more definitive, linking increased concentrations of atmospheric greenhouse gases (GHGs) and consequent global warming to human activities. As a response, ASHRAE is increasing its attention to standards, regulations, legislation and policies that involve GHGs.

When developing policies to address climate change, it is important to consider that buildings and their heating, ventilating, air conditioning, and refrigeration (HVAC&R) systems directly and indirectly contribute to GHG emissions. Buildings are responsible for 34% of global final energy use and 37% of energy-related emissions worldwide.¹ These emissions are associated with construction and the energy needed to operate buildings and building systems, and to a lesser extent through the release of refrigerants and other GHGs, in particular if they are not properly managed. According to the United Nations Intergovernmental Panel on Climate Change (IPCC), “buildings offer immediately available, highly cost-effective opportunities to reduce energy demand, while contributing to meeting other key sustainable development goals including poverty alleviation, energy security and improved employment.”² Improving the energy efficiency and the ongoing efficient performance of building systems provide a significant opportunity for climate change mitigation.

ASHRAE's ROLE

ASHRAE is the leading source of information and research for HVAC&R systems and building performance. ASHRAE's technical resources help address buildings' contribution to climate change including through these standards:

- Standard 90.1-2022, *Energy Efficiency Standard for Sites and Buildings Except Low-Rise Residential Buildings*
- Standard 90.2-2024, *High-Performance Energy Design of Low-Rise Residential Buildings*
- Standard 90.4-2022, *Energy Standard for Data Centers*
- Standard 100-2024, *Energy and Emissions Building Performance Standard for Existing Buildings*
- Standard 189.1-2023, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*
- Standard 189.3-2021, *Design, Construction, and Operation of Sustainable High-Performance Health Care Facilities*

¹ United Nations Environment Programme (2024), “Global Status Report for Buildings and Construction: Beyond foundations: Mainstreaming sustainable solutions to cut emissions from the buildings sector.” Nairobi. <https://doi.org/10.59117/20.500.11822/45095>.

² Lucon, Oswaldo, and Diana Ürge-Vorsatz. “AR5 Synthesis Report: Climate Change 2014.” *Chapter 9: Buildings*, United Nations Intergovernmental Panel on Climate Change, 2014, https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter9.pdf. ³ For more information, see www.ashrae.org/technical-resources/aedgs.

- Standard 105-2021, *Standard Methods for Determining, Expressing, and Comparing Building Energy Performance and Greenhouse Gas Emissions*
- Standard 228-2023, *Standard Method of Evaluating Zero Net Energy and Zero Net Carbon Building Performance*
- Proposed Standard 240P, *Quantification of Life Cycle Greenhouse Gas Emissions of Buildings*
- Proposed Standard 242P, *Standard Method for Calculation of Building Operational Greenhouse Gas Emissions*

Other ASHRAE resources for addressing climate change include:

- ASHRAE and its partners have published several free-to-download [Advanced Energy Design Guides](#) (including Zero Energy Building Guides for K-12 Schools and Offices), which provide educational guidance to reduce energy consumption while achieving acceptable IEQ conditions.

ASHRAE's VIEW

ASHRAE is committed to a leadership role in reducing climate change associated with building systems and responding to climate change experienced in the built environment.

ASHRAE recommends:

- States adopt the most recent version of Standard 100 for existing buildings and Standard 90.1 for new buildings.
- The evaluation of new and existing buildings' climate impacts, carbon balance, and energy performance.
- Funding for research that improves energy efficiency/utilization in HVAC&R technology to minimize GHG emissions.
- Funding for building science research leading to improved
 - advanced equipment and systems
 - grid-interactive designs
 - ability to load-shift
 - integration of the Internet of Things (IoT)
 - net metering
 - building based energy storage systems and demand response technology
- Promotion of carbon and energy life-cycle analysis to building owners to encourage sustainable building construction, operation and renewal.



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CONSENSUS STANDARDS: EXPERT SOLUTIONS TO MEET GLOBAL NEEDS

THE ISSUE

Voluntary consensus technical standards developed by private organizations are essential for a productive global economy and to facilitate global commerce. Standards foster safe and effective building technology innovation by providing a transparent baseline and needed metrics for assessing how that technology can impact building design, performance, and occupants. They are necessary for comparing technologies in the expanding global marketplace and facilitating cross-border collaboration. Voluntary consensus standards are also critical for building rating systems, which establish credible performance benchmarks and recognition frameworks, serving as an effective tool to move markets. Governments and model code bodies recognize the value of voluntary consensus standards and adopt them for use in building codes and regulations.

Voluntary consensus technical standards are developed through the participation of qualified, interested, and affected stakeholders including manufacturers, consumers, users, advocacy organizations, and representatives of government and academia. Standards accreditors such as the American National Standards Institute (ANSI), the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) follow several principles such as consensus, balance, transparency, due process, and technical expertise.

Copyright protection of voluntary consensus technical standards is critical to the continued development and maintenance of standards. Governments at all levels benefit from the application of standards by private organizations who rely on copyright protection to continue the maintenance of existing standards and development of future standards. Without copyright protection, standards development organizations will be challenged to provide the public with the benefit of rigorous, science-backed standards.

In the United States, policymakers have considered voluntary consensus standards so critical that federal law (the National Technology Transfer and Advancement Act of 1995), supplemented by OMB Circular A-119, directs federal agencies to use voluntary consensus standards wherever possible in their procurement and regulatory activities in lieu of expending public resources developing government-unique standards. Current policy recognizes that reliance on voluntary consensus standards protects public health and safety, saves taxpayers money, encourages long-term growth for U.S. businesses, and promotes the global competitiveness of American enterprises.

ASHRAE's ROLE

ASHRAE develops and publishes robust consensus technical standards; many of which are adopted directly by governments or into building codes. ASHRAE standards establish requirements in the areas of heating and cooling, indoor air quality, energy efficiency and management, building water systems, high-performance buildings, and safe refrigerant use, among many others. ASHRAE's standard development process is rigorous; ASHRAE is one of only six standards-developing organizations in the U.S. that can self-certify that its

standards have followed ANSI's procedures.

ASHRAE also serves on U.S. Technical Advisory Groups (TAGS) for ISO Committees and in the role of international secretariat for ISO Technical Committees to help ensure that ASHRAE views are represented. These standards are supported by technical committees that develop publications and educational materials to assist in the application of ASHRAE standards. ASHRAE standards are developed by experts from around the globe under strict ethical and non-commercialism guidelines.

ASHRAE's VIEW

Use of voluntary consensus standards at all levels of government are a benefit to society. For this reason:

- Government entities should continue to support voluntary consensus standard development, use, and adoption in laws and regulations, which can protect public health and safety, foster technological innovation, improve commerce, and save taxpayers money.
- Agencies should work with standards developers and industry experts to identify situations where societal interests could be addressed with voluntary consensus standards.
- Governments should continue to foster and support the unique character and strengths of the public-private partnership in standards development as they pursue trade and other international agreements, regulatory harmonization, and legislative and regulatory approaches.
- Governments should support policies, both domestically and internationally, which ensure the continued ownership and control of the copyrights and trademarks of standards developers. This includes notifying standard developers when they adopt or incorporate standards by reference.
- Policy makers should participate in the development of voluntary consensus standards and government officials should encourage their staff who are subject matter experts to participate through work release time and reimbursement of expenses incurred.
- Governments need to regularly update regulations and policies to reference the latest versions of standards to reflect the latest technical advances, which can help protect public health, improve resilience and sustainability.



Shaping Tomorrow's Global
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BUILDING ENERGY BENCHMARKING, ASSESSMENTS, AND PERFORMANCE TARGETS

THE ISSUE

Heating, ventilation, air conditioning, and refrigeration (HVAC&R) account for 62% of commercial building site energy use.¹ While new buildings have realized improved energy performance, existing buildings represent the greatest opportunity for energy and greenhouse gas (GHG) emissions reductions. Improving the energy performance of existing buildings requires a robust building energy database. Without understanding a building's true performance, identifying effective improvements in energy efficiency is challenging. As the saying goes, "you can't manage what you don't measure."

To address this concern, building energy benchmarking has become a critical tool for quantifying and evaluating building operational energy use patterns. Benchmarking data can inform public policies that focus on the most effective ways to reduce energy use in a city or state's building stock. Benchmarking data can also be used to develop local energy and GHG emissions performance targets appropriate to local climate and building types.

Many jurisdictions, including 50 cities and seven states across the U.S., have building energy benchmarking programs.² Some jurisdictions require actions beyond benchmarking, such as performing energy assessments (audits, tune-ups, or retrocommissioning) or meeting performance targets (maximum energy use or GHG emissions). Cities such as Boston, Denver, New York City, Vancouver, and Washington DC have set aggressive GHG emissions reduction goals for existing buildings that will require accurate benchmarking to determine emissions and energy savings.

ASHRAE's ROLE

ASHRAE develops standards, guidance and educational resources informed by robust data on the actual energy performance of buildings and offers evidence-based best practices and technical information for use by municipalities and professionals across the building sector as follows.

- **Benchmarking:**
 - ASHRAE Standard 105-2021, *Standard Methods of Determining, Expressing, and Comparing Building Energy Performance and Greenhouse Gas Emissions* provides a method for determining and comparing building energy performance

¹ Includes domestic hot water heating; 2012 Commercial Building Energy Consumption Survey: Energy Usage Summary. U.S. Energy Information Administration, 18 March 2016, <https://www.eia.gov/consumption/commercial/reports/2012/energyusage/>

² Comparison of U.S. Commercial Building Energy Benchmarking and Transparency Policies. Institute for Market Transformation, July 2022, <https://www.imt.org/resources/comparison-of-commercial-building-benchmarking-policies/>

- and greenhouse gas emissions.
- ASHRAE Standard 214-2017, *Standard for Determining and Expressing Building Energy Performance in a Rating Program* provides uniformity in the building energy labeling and disclosure process.
- ASHRAE Standard 228-2023, *Standard Method of Evaluating Zero Net Energy and Zero Net Carbon Building Performance* provides consistent method definitions of “zero net energy” and “zero net carbon” for both the design of new buildings and the operation of existing buildings.
- ASHRAE Standard 240P, *Evaluating Greenhouse Gas (GHG) and Carbon Emissions in Building Design, Construction and Operation* will provide a whole life carbon approach to support emissions reductions in buildings.
- **Energy audits and assessments:**
 - ASHRAE Standard 211, 2023 *Standard for Commercial Building Energy Audits* establishes consistent practices for conducting and reporting energy audits for commercial buildings. *Referenced by ordinances in Atlanta, GA; Boulder, CO; Los Angeles, CA; New York, NY; and San Francisco, CA.*
 - *Commercial Buildings Energy Audits Reference Manual* is a reference that defines best practices for energy survey and analysis for purchasers and providers of energy audit services and serves as a reference for Standard 211.
- **Building performance targets:**
 - *Building Performance Standards: A Technical Resource* provides technical basis and resources to policymakers, building owners, facility managers, design professionals and ASHRAE members when developing and implementing a Building Performance Standard (BPS).
 - ASHRAE Standard 100-2024, *Energy and Emissions Building Performance Standard for Existing Buildings* sets energy use intensity (EUI) benchmarks for existing buildings in the commercial and residential sector and establishes methods for determining opportunities for improvement in EUI leading to compliance with the standard benchmarks. *Referenced by Washington State’s Clean Buildings Act of 2019.*
 - ASHRAE’s Building EQ³ program calculates a building’s energy performance in relation to other similar buildings, identifies the gap between “as designed” potential and actual performance in operation, and provides recommendations to reduce energy use. Building EQ can be used to publicly display building energy use and comply with disclosure requirements.

ASHRAE certification programs exist to meet the industry needs of today and provide value to thousands of built-environment professionals, employers, and building owners. Certifications like Building Commissioning Professional (BCxP) and Building Energy Assessment Professional (BEAP) are recognized by the U.S. Department of Energy (DOE) as meeting the Better Buildings Workforce Guidelines (BBWG) and are used frequently by local jurisdictions to designate who is qualified to perform benchmarking and energy assessments.

ASHRAE’s VIEW

Energy metrics that are widely accepted, robust, and validated are critical to achieving policy objectives. Standardized procedures for energy performance assessments ensure an appropriate level of rigor and scope of work. Within a building owner’s portfolio or across a city’s

³ For more information, see <https://www.ashrae.org/technical-resources/building-eq>
 ASHRAE Government Affairs Office 1255 23rd Street NW, Suite 825, Washington, DC 20037
 Tel: 202.833.1830 | GovAffairs@ashrae.org

building stock, decision-makers need consistent language, metrics, and procedures to effectively communicate goals, evaluate potential investments, and measure success. These benchmarking policies rely on building owners having access to accurate building energy use data. ASHRAE remains dedicated to sharing technical resources with policymakers to support legislative and regulatory solutions that improve building energy efficiency and reduce GHG emissions.



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ENVIRONMENTAL TOBACCO SMOKE AND ELECTRONIC NICOTINE DELIVERY SYSTEMS

THE ISSUE

While indoor smoking has become less common in many countries, the use of Electronic Nicotine Delivery Systems (ENDS) has significantly increased and policies that respond to these increases are still being developed. Both smoking and the use of ENDS negatively affect indoor air quality, and each has inherent health risks.

Exposure to Environmental Tobacco Smoke (ETS) continues to have considerable health and cost impacts. Researchers have investigated the health and irritant effects among non-smokers exposed to tobacco smoke in indoor environments. Such exposure may be called passive smoking or exposure to secondhand smoke. Exposure of non-smokers to tobacco smoke causes specific diseases and other adverse effects to human health, most significantly cardiovascular disease and lung cancer.¹ No cognizant authorities have identified an acceptable level of ETS exposure to non-smokers, or expectation that further research will identify such a level.

Simultaneously with the decline of tobacco smoking, the use of Electronic Nicotine Delivery Systems (ENDS) including vape pens, electronic cigarettes, and other devices that convert nicotine into an inhalable aerosol without combustion has rapidly increased. The aerosol emitted from these devices contains varying amounts of nicotine dissolved in propylene glycol, or glycerol along with volatile organic compounds (VOCs).²³ Unique to the use of ENDS are the concentration and type of compounds that may deposit and remain on indoor surfaces. These deposits represent a unique source of contamination in buildings that varies depending on indoor climate, airflow and surface area and may require specialized cleaning, HVAC maintenance, and other operational practices.⁴ In addition, limited studies have been performed to evaluate the chemical reactions and health interactions that may occur between ENDS emissions and other airborne contaminants commonly found indoors. Effects of secondhand exposure to ENDS have not been thoroughly studied by the scientific community, in part because these devices are new, evolving, diverse and customizable. However, because ENDS have become so prevalent, indoor building components and occupants are being passively exposed to their emissions

Despite the well-documented benefits of smoking bans, many locations worldwide still lack laws and policies that provide complete protection within buildings. Still fewer prohibit the use of ENDS indoors. In many locations, laws and policies are only partially protective, permitting smoking and ENDS usage in certain areas of buildings or specific building types

¹ Centers for Disease Control and Prevention. Health Problems Caused by Secondhand Smoke. Updated Jan. 31, 2025. <https://www.cdc.gov/tobacco/secondhand-smoke/health.html>

² Offermann 2015. F.J. Offermann, "Chemical Emissions from E-Cigarettes: Direct and Indirect Passive Exposures," *Building and Environment*, Vol. 93, Part 1, 101-105, November, 2015.

³ Cooke 2015. Cooke, Andrew, MDa, et. al., "The Electronic Cigarette: The Good, the Bad, and the Ugly," *J Allergy Clin Immunol Practice*, 2015, Vol. 3, 498-505.

⁴ Schripp 2013. Schripp, et. Al., "Does e-cigarette consumption cause passive vaping?" *Indoor Air* 2013; 23: 25–31

including casino, entertainment and multifamily housing.

ASHRAE's ROLE

Providing healthy and comfortable indoor environments through the management of indoor air quality is a fundamental goal of building and HVAC design and operation. ASHRAE has long been active in providing engineering technology, standards and design guidance in support of this goal. For example, ANSI/ASHRAE Standards 62.1-2025, *Ventilation and Acceptable Indoor Air Quality* and 62.2-2025, *Ventilation and Acceptable Indoor Air Quality in Residential Buildings* are standards that specify minimum ventilation rates and other measures, including the prohibition of smoking or using ENDS, to manage indoor air quality. ~~Therefore, the health effects of indoor exposure to emissions from tobacco products, and ENDS devices are relevant to ASHRAE.~~

ASHRAE's VIEW

Exposure to ETS can be reduced through a variety of strategies, but they do not completely eliminate exposure. Only indoor smoking bans, leading to near zero exposure, have been recognized by health authorities as providing effective control. Numerous recognized public health organizations advise caution in all situations of human exposure when limited data is available about health impacts. Applying this principle to ENDS argues that involuntary exposure should be banned to keep exposure to airborne emissions as low as possible.

ASHRAE's mission to act for the benefit of the public encourages lawmakers, policymakers and others who exercise control over buildings, to effectively limit secondary exposure caused by smoking and ends from smoking and ENDS use inside and near buildings. ASHRAE also recommends:

- For buildings in which smoking and ENDS use is permitted, design practitioners work with their clients to define their goals for addressing exposure and that that they educate them on the limits of engineering controls for both ETS and ENDS. Multifamily buildings have complete bans on tobacco smoking and ENDS inside and nearby to protect nonsmoking adults and children.
- Further research be conducted by recognized health authorities on the health effects of involuntary exposure in the indoor environment from smoking cannabis, using hookahs and ENDS. Pending the outcome of that research, cannabis and hookah smoking should be managed as recommended for ETS and ENDS.



Shaping Tomorrow's Global
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INDOOR AIR QUALITY

THE ISSUE

The average adult breathes about 2,000 gallons (7,570 liters) of air each day, and most people spend around 87% of their time within buildings. This sets the stage for the importance of indoor air quality (IAQ). IAQ has a significant impact on a person's health, performance, and wellbeing. Indoor air is a significant source for airborne contaminants that may contain particles and gases with impacts ranging from eye and respiratory irritation to exposure to infectious pathogens, poisonous compounds, or carcinogens. These contaminants can impact health, comfort, wellbeing, learning, sleep, and performance in workplaces and schools, which in turn has economic impacts.

The direct connection between health and wellness encourages building designers and operators to prioritize IAQ in buildings. Cost-benefit analyses have estimated health and economic benefits of improved IAQ to be far greater than the costs of implementing strategies to improve IAQ. There are three widely accepted approaches to improve IAQ: source control, ventilation, and air cleaning. Many strategies exist to facilitate good IAQ efficiently, to lower energy use and improve occupant satisfaction.

ASHRAE's ROLE

The critical connection between IAQ and building HVAC systems has made IAQ a fundamental issue for ASHRAE and its members for more than 50 years. ASHRAE provides technical resources, coordinates and funds research, organizes conferences, and educates practitioners about IAQ.

ASHRAE developed and continues to support standards, guidelines, and other resources related to efficiently improving IAQ, such as:

- **Standard 62.1-2025, *Ventilation and Acceptable Indoor Air Quality*** – This standard establishes ventilation and other IAQ requirements for buildings other than residential and health care. It is referenced by most green commercial building programs.
- **Standard 62.2-2025, *Ventilation and Acceptable Indoor Air Quality in Residential Buildings*** – Residential (multifamily to single family homes) ventilation requirements from this standard have been adopted into numerous codes and the U.S. Environmental Protection Agency's (EPA) Indoor airPlus program.
- **Standard 161-2024, *Air Quality within Commercial Aircraft*** - This standard defines the requirements for air quality in air-carrier aircraft and specifies methods for measurement and testing.
- **Standard 170-2021, *Ventilation of Health Care Facilities*** – This standard is widely used in building codes for ventilation requirements in hospitals and other health care facilities.
- **Standard 189.1-2023, *Standard for the Design of High- Performance Green Buildings*** U.S. Green Building Council, the ***Except Low-Rise Residential Buildings*** – This standard was developed in conjunction with International Code Council, and the Illuminating Engineering Society. It provides IAQ requirements beyond those in Standard 62.1.
- **Standard 241-2023, *Control of Infectious Aerosols*** – This standard defines the amount of

equivalent clean airflow necessary to substantially reduce the risk of disease transmission during infection risk management mode. It also sets requirements for air cleaner testing and for assessment, planning, and implementation of infectious aerosol controls.

- **Guideline 42-2023, *Enhanced Indoor Air Quality in Commercial and Institutional Buildings*** – This Guideline recommends measures that exceed the minimum requirements in Standard 62.1 to provide enhanced indoor air quality.
- **Guideline 44-2024, *Protecting Building Occupants from Smoke During Wildfire and Prescribed Burn Events*** – This guideline recommends building measures to minimize occupant health impacts caused by smoke from wildfire and prescribed burn events.
- **ASHRAE Indoor Air Quality Guide: *Best Practices for Design, Construction, and Commissioning* and *ASHRAE Residential Indoor Air Quality Guide: Best Practices for Acquisition, Design, Construction, Maintenance and Operation*** – These guides present best practices that have proven successful in building projects to achieve good IAQ.
- ***Damp Buildings, Human Health and HVAC Design*** – This report provides a summary of what is understood about dampness-related health risks in buildings as well as suggestions for HVAC system designers that can help avoid such risks.

ASHRAE'S VIEW

ASHRAE's view is that the provision of acceptable IAQ is an essential building service. Improved IAQ brings substantial health and economic benefits from a broad public health perspective, as well as to individual building owners and occupants.

Therefore, ASHRAE recommends that:

- Achieving and maintaining good IAQ should be included in all decisions (including policy decisions) that affect the design and operation of buildings and HVAC systems, including efforts to improve building energy efficiency, sustainability, resiliency, and the management of infectious diseases. In particular, operating and maintaining building systems according to the relevant ASHRAE standards should be required to ensure that the building continues to meet IAQ standards over its lifetime.
- Policymakers should also consider the impacts of extreme heat on IAQ, and as the frequency of extreme heat events continues to increase, jurisdictions should establish indoor temperature requirements consistent with ASHRAE Standard 55, Thermal Environmental Conditions for Human Occupancy
- The importance of IAQ and the fundamentals of achieving good IAQ through building design and operation should be included in education programs for all built environment stakeholders– from developers, owners, and operators to designers, technicians, and consultants.
- The latest versions of ASHRAE's IAQ standards should be adopted by building codes and regulations when they are updated every three years.
- Research and standards development should be supported by the government, including consideration for a national model standard, improvement of indoor contaminant monitoring and measurement technologies, approaches to improving IAQ beyond ventilation and filtration (e.g., air cleaning), development of tools to assess the economic valuation of IAQ benefits, and improved understanding of new contaminants of concern and techniques for removing them.



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INDOOR CARBON DIOXIDE, VENTILATION AND INDOOR AIR QUALITY

THE ISSUE

Indoor CO₂ has been considered in the context of building ventilation and indoor air quality (IAQ) for centuries. Most of these discussions have focused on how CO₂ concentrations relate to occupant perceptions of IAQ, and the use of CO₂ to evaluate ventilation rates and control of outdoor air intake rates (demand control ventilation). While these topics have been studied for decades, misinterpretation of CO₂ concentration as an indicator of IAQ and ventilation is common in the HVAC industry, the IAQ research community, and the public.

While regulations and policies may focus on indoor CO₂ in effort to improve IAQ, existing evidence for direct impacts of CO₂ on health, well-being, learning outcomes, sleep patterns, and work performance at commonly observed indoor concentrations is inconsistent. Indoor CO₂ monitoring has also been promoted as a ventilation indicator to help manage the risks of airborne disease transmission; however, concerns have long existed regarding the accuracy of indoor CO₂ concentration measurements, which are now more common due to the availability of less expensive sensors. Given these factors, as well as increasing calls to monitor CO₂ in buildings, ASHRAE is working to clarify the use of indoor CO₂ measurements as a tool to help improve IAQ and building ventilation.

ASHRAE's ROLE

ASHRAE has long been active in providing engineering technology, standards, and design guidance to support the goal of providing healthy and comfortable indoor environments in an energy-efficient manner. For decades, these efforts have focused on providing effective ventilation in buildings, designing and operating ventilation systems and managing the wide range of air pollutants within buildings. For example, ANSI/ASHRAE Standards 62.1-2022, *Ventilation and Acceptable Indoor Air Quality* and 62.2-2022, *Ventilation and Acceptable Indoor Air Quality in Residential Buildings* are standards that specify minimum ventilation rates and other measures to support the health, comfort and productivity of building occupants; these standards do not include CO₂ limits based on human health and comfort. ASHRAE Standard 62.1 contains CO₂ differential concentration setpoints for the application of demand control ventilation, but they are not intended to be and should not be used as indicators of IAQ.

ASHRAE's VIEW

Monitoring indoor CO₂ can be a useful tool for understanding building ventilation and IAQ, supporting efforts to provide high quality indoor environments and manage the energy needed to do so. Critically, indoor CO₂ measurements should be understood in the context of the built environment to ensure that they are measured and interpreted in a meaningful way. Claims that ASHRAE Standard 62.1, *Ventilation and Acceptable Indoor Air Quality*, requires indoor CO₂ concentrations below a certain threshold (typically 1,000 ppm) for acceptable indoor air quality

are *incorrect*¹. ASHRAE's IAQ Standards do not use indoor CO₂ values to determine acceptable indoor air quality, as IAQ is impacted by multiple factors (such as temperature, humidity, particulate matter, gas pollutants, etc.).

Because of ASHRAE's mission to act for the benefit of the public, it encourages building designers, lawmakers, policymakers and others to craft informed recommendations for the measurement of indoor CO₂ concentrations. To that end, ASHRAE stresses that:

- Indoor CO₂ concentrations do not provide an overall indication of IAQ, but they can be useful in IAQ assessments if users understand the limitations in these applications (e.g., number and activity level of occupants compared to the design capacity, length of time a space has been occupied, no combustion or other sources of CO₂ that could impact readings). While CO₂ readings below a threshold value do not assure overall acceptable IAQ, CO₂ readings far above expected ranges likely indicate the ventilation system is not functioning properly.
- Existing evidence for the impacts of CO₂ on health, well-being, learning outcomes and work performance is inconsistent and does not currently justify changes to ventilation and IAQ standards, regulations, and guidelines.² However, CO₂ can be used to verify if ventilation system performance meets existing IAQ standards, regulations, and guidelines.
- The use of indoor CO₂ measurements to evaluate the risk of airborne disease transmission must account for the type of space and its occupancy and the differences in CO₂ and infectious aerosols. For example, CO₂ concentration is unaffected by filtration and most other air-cleaning methods that reduce infectious aerosol concentration, so it should not be used as a *direct* indicator of infection risk.
- Sensor accuracy, location, and calibration are all critical for drawing meaningful inferences from measured indoor CO₂ concentrations.
- Programs or requirements to monitor CO₂ in buildings, when conducted with an understanding of their technical basis, can be helpful, but monitoring CO₂ without such understanding can lead to confusion on the part of building occupants and the public.

¹ Persily, A. 2022. *Development and application of an indoor carbon dioxide metric*. Indoor Air. Volume 32, Issue 7.

² In a 2010 study by J.M. Logue, T.E. McKone, M.H. Sherman, and B.C. Singer of the Berkeley National Laboratory titled, Hazard Assessment of Chemical Air Contaminants Measured in Residents, fifteen pollutants were identified as contaminants of concern for chronic health effects in a large fraction of homes. Nine pollutants were identified as priority hazards: acetaldehyde; acrolein; benzene; 1,3-butadiene; 1,4-dichlorobenzene; formaldehyde; naphthalene; nitrogen dioxide; and PM_{2.5}. Activity-based emissions are shown to pose potential acute health hazards for PM_{2.5}, formaldehyde, CO, chloroform, and NO₂.



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REFRIGERANTS AND THEIR RESPONSIBLE USE

THE ISSUE

Choosing a refrigerant for a given HVAC&R application has become increasingly complex due to direct and indirect environmental impacts, performance, cost-effectiveness and safety for employees and the public. Following the implementation of the Kigali Amendment to the Montreal Protocol in 2019, lower global warming potential (GWP) refrigerants are beginning to replace high-GWP refrigerants. Many of the lower-GWP refrigerants are mildly flammable, which requires the updating of building codes and standards. Ultra-low-GWP refrigerants are also being used and considered for certain applications, and it is important to ensure these refrigerants are used safely, efficiently, and cost-effectively.

ASHRAE's ROLE

With its technical expertise, ASHRAE plays a key role in guiding the selection and analysis of new refrigerants and the potential environmental and societal consequences of their use. ASHRAE contributed to successfully phasing out the use of ozone-depleting refrigerants and is already contributing to reducing high-GWP refrigerant use. ASHRAE develops voluntary technical standards and guidelines governing the classification, application, and use of refrigerants, which are referenced by various codes and regulations, globally.

As lower-GWP refrigerants become more prevalent, ASHRAE commits to their safe application in residential, commercial, and industrial uses as prescribed by Standard 34-2024, *Designation and Safety Classification of Refrigerants*, Standard 15-2024, *Safety Standard for Refrigeration Systems*, and the Standard 15.2-2024, *Safety Standard for Refrigeration Systems in Residential Applications*. Significant updates to these standards were made to address safe use of lower-GWP A2L refrigerants. ASHRAE, through research and its consensus-based process continues to pursue revisions to its standards that support the safe use of lower-GWP refrigerants.

ASHRAE's VIEW

ASHRAE encourages adoption of updated building codes and standards that enable safe use of lower-GWP refrigerants. As the transition to more climate-friendly alternatives continues, ASHRAE supports reducing emissions from high-GWP refrigerants through research, education, and improvements to design, installation, operation, maintenance, and decommissioning of equipment, including minimization of leakage and accurate accounting and reporting in accordance with applicable standards and policies.

ASHRAE supports the global phasedown of the production and consumption of high-GWP refrigerants and encourages the adoption of the latest standards in order to enable use of lower-GWP refrigerants. ASHRAE continues to update its standards to reflect lower-GWP refrigerants and solutions.

Furthermore, used refrigerants should be safely recovered for reuse, recycle, reclamation, or destruction during service or at the end of the equipment life. ASHRAE advocates for comprehensive technician training programs to ensure safe handling of mildly flammable refrigerants and compliance with updated standards. Refrigerant inventory and management programs should be implemented to closely track refrigerant use.



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RESILIENCY IN THE BUILT ENVIRONMENT

THE ISSUE

Resiliency in the built environment is a complex subject that involves many disciplines. As defined in the National Academy of Sciences report *Disaster Resilience: A National Imperative*, resiliency is "the ability to prepare and plan for, absorb, recover from and more successfully adapt to adverse events or threats." These events or threats may be financial, political, environmental, as well as disaster, conflict, cyber, climate, or health related. Its recent prominence is in part due to increasing concerns over the adequacy of responses to natural and climate-related events around the world, as well as recognition that many such events are likely to increase in frequency and severity.¹ According to the National Oceanic and Atmospheric Administration (NOAA), the U.S. has sustained 400 weather and climate disasters since 1980 where overall damages/costs reached or exceeded \$1 billion (including CPI adjustment to 2024). The total cost of these 400 events exceeds \$2.785 trillion.²

Strengthening the built environment is vital to protecting the public when natural and human-induced events occur. Buildings often serve as the first line of defense and as a result, the built environment and engineered systems in buildings must become more resilient in how they are designed and operated to protect the public. A building's ability to recover and be available to occupants following such an event can have widespread economic and health implications. Additionally, as the built environment becomes more interconnected and operations shift towards automation, building systems will see increased vulnerability to cyber threats.

ASHRAE's ROLE

It is ASHRAE's position that building design and operation must consider resiliency as part of an overall risk assessment and planning approach, and that major new efforts in research, education, standards and guidelines, and guidance documents are required to increase building resiliency. Building resiliency is of such importance that it was identified as one of four key initiatives in the 2019-2024 ASHRAE Strategic Plan.

ASHRAE also has partnered with CIBSE to release a Joint Position Document on Resiliency in the Built Environment.³ The two societies are committed to taking a leadership role with respect to building resiliency. ASHRAE will be developing and adopting designs, materials, components, systems, and processes that minimize the adverse impacts of extreme events and environmental changes over time.

¹ IPCC. 2014. Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Geneva, Switzerland: Intergovernmental Panel on Climate Change. www.ipcc.ch/report/ar5/.

² "Billion-Dollar Weather and Climate Disasters: Overview." National Climatic Data Center, National Oceanic and Atmospheric Administration, <https://www.ncei.noaa.gov/access/billions/>. Accessed 18 December 2024.

³ ASHRAE & CIBSE. Position Document on Resiliency in the Built Environment". <https://www.ashrae.org/about/position-documents>

ASHRAE's VIEW

Investing in building resiliency is crucial to saving lives, protecting public property, and reducing the financial strain of post-disaster recovery. For these reasons, ASHRAE sees the need for policy setting entities world-wide to encourage sound, balanced, and innovative actions to address long-range resiliency issues and the specific technical concerns associated with them.

When it comes to strengthening the built environment, building codes and standards, such as those developed by ASHRAE, make our communities more sustainable, more efficient and more resilient. **According to a 2020 study released by FEMA, by adopting the most recent building codes, there is an impressive cost-benefit ratio of about \$11 for every \$1 invested towards hazard mitigation.** Unfortunately, most jurisdictions have not yet adopted the most recent standards and codes that are based on the latest research and technological innovation. Legislators and other government officials should examine the best ways to assist these jurisdictions with the adoption, implementation and enforcement of the most recent building energy efficiency codes and standards, as high-efficiency buildings rely less on the grid and are thus more resilient. This will help provide a more sustainable future and improve the resilience of the built environment. ASHRAE is committed to being a resource for government with respect to building codes and standards and will continue to publish and maintain consensus-based building standards, guidelines, and Design Guides.

ASHRAE also holds the following positions with respect to resiliency in the built environment:

- Resiliency is an important societal, economical, and technical issue that has a major impact on the built environment as well as how engineered building systems are designed and operated.
- Technical solutions to these challenges are needed, including the application of emerging technologies. These solutions will include research, standard and guideline development, and the production of educational material.
- Policy setting entities need to encourage sound, balanced, and innovative actions to address the broad issues of resiliency and the specific technical concerns associated with them.
- Built environments need to be developed which are both resilient and sustainable.

ASHRAE also recommends that new and continuing research be conducted to guide resilient infrastructure, building systems and community designs. ASHRAE aims to continue collaborating on building resiliency research opportunities with external organizations, national and international government agencies, and foundations.



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STEM EDUCATION AND HVAC&R WORKFORCE DEVELOPMENT

THE ISSUE

Commitment to providing a solid education in science, technology, engineering and mathematics (STEM) to develop the future workforce of technicians, engineers, and scientists is critical to our future well-being and standard of living. Students pursuing non-STEM specialties also need basic knowledge of scientific and technological applications for effective participation in the workforce, success in their personal lives, and responsible citizenship.

Moreover, there has been increased growth in jobs related to STEM that have not been filled due to a workforce shortage. The U.S. Bureau of Labor Statistics projects that employment in architecture and engineering occupations is expected to grow faster than other fields. The workforce shortage has driven salaries in architecture and engineering occupations such that the 2024 median annual wage was \$97,310 compared to \$49,500 across all occupations.¹ Additionally, about 186,500 openings for employment in these fields are projected each year on average over the next decade.²

The HVAC&R workforce in North America remains a male-dominated employment sector; the share of female workers in engineering and architecture is 14%³ and 5.9% of HVAC&R Technicians.⁴ Additionally, under-represented minority students receive only 24% of the degrees associated with the building and HVAC&R engineering sectors.⁵

ASHRAE's ROLE

As practitioners and educators in various STEM careers, ASHRAE strongly promotes active engagement by members in their local communities and national programs with mentoring and educational opportunities in STEM fields. ASHRAE is actively engaged in [ASHRAE 100](#), National Engineers Week, the Engineering Workforce Consortium, and other STEM education efforts worldwide, including through its 342 active student branches.

ASHRAE is also a member of the National STEM Education Coalition, which supports new and innovative initiatives that help improve the content, knowledge, skills, and professional development of the K-12 STEM teacher workforce and informal educators. ASHRAE is dedicated to ensuring quality STEM programs for teachers and students all around the world by encouraging its members to get involved with their local school systems.

ASHRAE's Board of Directors has committed to promoting diversity and inclusion in all levels of the society. This includes efforts to promote STEM education and training to children, schools, and educators, in a way that will attract, train, and retain more women, disabled, LGBTQ, and people of all socioeconomic and ethnic backgrounds to STEM education and employment.

¹ U.S. Bureau of Labor Statistics. 2025. Occupational Outlook Handbook: Architecture and Engineering Occupations.

² U.S. Bureau of Labor Statistics. 2024. Occupational Outlook Handbook: Architecture and Engineering Occupations.

³ U.S. Bureau of Labor Statistics. 2017. Women in architecture and engineering occupation in 2016.

⁴ Zippia, 2022. Heating and Cooling Technician Demographics and Statistics in the US. <https://www.zippia.com/heating-and-cooling-technician-jobs/demographics/>.

⁵ U.S. National Science Foundation, 2024. Women, Minorities, and Persons with Disabilities in Science and Engineering. <https://nces.nsf.gov/pubs/nsf21321/report/field-of-degree-minorities>

ASHRAE also supports strengthening the broader HVAC&R workforce, including technicians who install and maintain HVAC&R equipment as well as distributors, contractors, and facility operators and managers. The HVAC&R and buildings industry has been facing a serious shortage of skilled trade employees for several years and has more recently been exacerbated by the overall shortage of U.S. workers. Unfortunately, there is a broadening skills gap as well due to several factors, including: the retirement of the baby boomers, advancements in technology that require new skills, increased job competition in the global marketplace, failure to cultivate and retain skilled talent, a societal focus only on four-year degree programs to the exclusion of technical and technological education, and a lack of emphasis on the necessary skill sets for advanced manufacturing. Of these, the last two are the most critical to ensuring innovative, high-efficiency products can be manufactured and installed properly. Community colleges, training programs, internships, apprenticeships and certification programs can strengthen the pipeline for the HVAC&R workforce.

Further, as artificial intelligence technologies become more advanced and integrated into the ways we learn and work, it is important that engineering-specific AI tools are developed with input from industry experts.

ASHRAE's VIEW

Future generations need to possess the skills and critical competencies necessary to be successful in a highly competitive, global, and technologically sophisticated economy. We must work cooperatively to ensure that students receive the STEM training essential for future success. ASHRAE encourages policymakers to implement the following recommendations:

- Increase government-funded research to improve teaching and learning of STEM concepts and critical thinking skills.
- Recruit, train, and retain qualified STEM teachers through the development of programs recognizing educators who excel in STEM education and incentives that encourage the best and brightest scientists, engineers, technologists, and technicians to act as role models and teachers to pave the way for future generations.
- Foster partnerships among educational institutions, industry and non-profit organizations and their members to introduce students of all backgrounds to STEM career opportunities, including those careers that do not require a university degree.
- Support and encourage students who choose to enroll in community or technical college, or other career and technical education programs, that prepare and qualify individuals for careers as HVAC&R technologists, technicians, facility operators, and buildings managers by providing these students with affordable tuition options.
- Ensure buildings and their systems are designed properly, and that the engineering workforce is highly qualified, by developing and maintaining requirements for professional engineering licensure that are realistic and inclusive of engineers' perspectives.
- Create opportunities and incentives for women and those of diverse backgrounds to pursue STEM coursework and careers and fostering environments that are welcoming all to stay in them.
-



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SMOKE FROM WILDFIRES AND PRESCRIBED BURNS: IMPLICATIONS FOR INDOOR ENVIRONMENTAL HEALTH

THE ISSUE

Wildfires are large-scale, uncontrolled fires that occur in forests, grasslands, and other landscapes. In recent years, the frequency and severity of wildfires have increased due to climate change. The smoke from these fires, along with that from prescribed burns, can cause significant air quality issues both outdoors and indoors. Wildfire smoke poses a risk to indoor air quality (IAQ) by introducing hazardous particles and gases into the air. These contaminants can enter buildings through open doors and windows, ventilation systems, or general air leakage. Once inside, they can remain airborne for long periods of time and lead to health symptoms such as eye irritation, coughing, difficulty breathing, headaches, nausea, and dizziness, as well as more severe health risks including heart attacks and strokes, especially among vulnerable populations. The health impacts caused by wildfire smoke make it essential for building owners/operators to take proactive steps towards reducing exposure among occupants wherever possible. While wildfires and prescribed burns are the driving issue, many of the concerns and much of the available knowledge and guidance have wider applicability to other smoke events.

ASHRAE's ROLE

ASHRAE develops consensus standards and guidelines and offers technical resources for managing the effects of wildfires in both commercial and residential buildings. These resources include:

- ASHRAE Guideline 44-2024, *Protecting Building Occupants from Smoke During Wildfire and Prescribed Burn Events* – provides guidance on how to protect building occupants from smoke during wildfire and prescribed burn events. The aim of the guideline is to provide a series of actions to be taken to reduce the risk of smoke infiltration into a building, protect its occupants from smoke, and reduce the need for evacuation. The guideline addresses risk reduction, guidance on selecting appropriate smoke management strategies, and information on air filtration and air-conditioning systems for smoke control. The guideline also addresses building envelope design and construction, and testing and commissioning of smoke management systems.
- [ASHRAE Planning Framework for Protecting Commercial Building Occupants from Smoke During Wildfire Events](#) – provides recommended heating, ventilating, and air conditioning (HVAC) and building measures to minimize occupants' exposures and health impacts from smoke during wildfire and prescribed burns.
- ASHRAE Residential Issue Brief, "[Wildfire Smoke Hazards for Dwelling Occupants](#)," 2021 – provides evidence-based information and guidance to protect residential building occupants from smoke exposure and to help designers create residential buildings and systems to limit smoke entry.

ASHRAE's VIEW

ASHRAE's view is that

- building owners/operators should take proactive measures to reduce exposure to wildfire smoke to manage negative IAQ impacts consistent with the recommendations of ASHRAE Guideline 44-2024. These include reducing outdoor air intake during high levels of wildfire smoke; installing effective filtration and cleaning systems; sealing cracks or gaps where outdoor air smoke can enter the building; monitoring IAQ conditions with reliable instruments; raising awareness among occupants about potential health effects of wildfire smoke exposure; using portable air filtration devices (HEPA or high MERV) when necessary; ensuring proper maintenance of HVAC systems; providing greater access to equipment such as respirators or masks when needed; consulting with local public health officials when necessary; and offering support services for those affected by poor IAQ conditions caused by wildfire smoke.
- Developers of codes and regulations should consider adding regionally appropriate requirements for protection of building occupants from wildfire smoke while maintaining building operations.

06 April 2026

To: Meghan McNulty Chair Government Affairs Committee
Mick Schwelder Vice Chair Government Affairs Committee
Alice Yates ASHRAE Staff

RE: Government Affairs Liaison Report

1. Technology Council meet on Wednesday Feb 4th of the Vegas meeting.
2. Standards completed the ASHRAE ANSI audit and ASHRAE remains a standards self-certifier. Related to this process changes were made to PASA.
3. The Operations Subcommittee discussed the support that Government affairs offers and reinforced communication with the Government affairs committee using GovAffairs@ashrae.org
4. Additional funding was approved for GTIC to assist with standards adaptation.
5. Position Documents
 - a. Technology council approved Refrigerant and their Responsible Use and Climate Change Position Documents which was sent the Board for approval.
 - b. The technology council approved creating of subcommittees to update the following position documents: Environmental Tobacco Smoke, Indoor Air Quality, and Building decarbonization.
 - c. The following position documents are currently in revision: Infectious Aerosols, Unvented Combustion Devices and Indoor Air Quality, Combustion of Solid Fuels and Indoor Air Quality in Primarily Developing Countries and Indoor Air Chemistry.
6. With the creation of the Center of Excellence for Indoor Environmental Quality Environmental health has requested additional members to address their growing workload.
7. Technology council approved creation of the Safety for next generation Refrigerants ad hoc committee
8. Residential presented their summary of a 3RD Residential Construction Market Stakeholders Workshop which occurred in December 2025. This summary included in this report.

Sincerely

Douglas Fick
2025-26 Technology Council Liaison

Cc: Devin Abellon Tech Council Chair
Trent Hunt Tech Council Vice Chair
Amber Thomas ASHRAE Staff

Encl: Residential Building Workshop Summary

Report:

3rd Residential Construction Market Stakeholder Workshop

December 7, 2025
Report Date: February 4, 2026

Prepared for:
ASHRAE Technology Council

Prepared by:
Residential Building Committee

Executive Summary

On December 7, 2025, ASHRAE's Residential Building Committee convened a third stakeholders' workshop to assist in expanding our understanding of the residential building industry and ways ASHRAE might further its mission in this critical market sector. For one day, roughly 30 stakeholders representing a diversity of interests met and discussed an array of topics, sharing their insights and observations about the residential buildings marketplace, as well as discussing various ways ASHRAE might effectively participate in, and support, that marketplace.

Interests represented in the workshop included residential new construction, existing buildings, HVAC, lighting, federal agencies, national laboratories, efficiency advocates, indoor environmental quality professionals, manufacturing interests and many more.

The workshop began with the keynote address from guest speaker Bryan Orr of Kalos Services. Following the keynote address, attendees participated in breakout sessions based on the four key initiatives (Relevance within ASHRAE, Decarbonization, Indoor Environmental Quality, Resiliency) from the 2024-2029 RBC Strategic Plan. Attendees reconvened to share their thoughts with the entire assembly at the end of the day.

Based on the input from the stakeholders, targeted action items and priorities for ASHRAE included:

- Continue strengthening ASHRAE's role as a "trusted source" for key issues of residential building performance, including energy efficiency and indoor environmental quality.
- Continue strengthening collaboration between public and private sector entities seeking to shape the residential building marketplace to address affordability for high performance building technologies.
- Continue identifying and addressing the research needs on various aspects of residential building performance, including IEQ and resilience topics.

- Help to translate existing technical information on key topics of residential building performance for multiple end users – from consumers to builders to financial institutions.
- Identify where ASHRAE might assist industry in strengthening and training the residential building labor workforce.
- ASHRAE should consider developing an integrated framework for residential resilience that sets clear survivability standards, incorporates risk and insurance data, and leverages post-disaster insights. This effort should also include hardened TC 2.7 and TC 2.10(withstand extreme events) HVAC equipment standards, support for research on extreme heat impacts, and incentives to drive adoption of resilient practices.
- ASHRAE should help industry reframe energy efficiency messaging to emphasize comfort, health, and long-term value while aligning with consumer priorities like utility savings and emotional decision-making. Additionally, ASHRAE should work with key industry stakeholders to foster holistic approaches that integrate trades, real estate, insurance, and broader benefits beyond simple payback to overcome adoption barriers.
- Engage with insurance and underwriters associations to find common ground for improving the resilience of the built environment and for ASHRAE to provide technical rationale for valuing higher performing and healthier residences.
- Recommend hosting stakeholder workshops at the chapter level to gain feedback from a wider audience. Many parts of the world have differing needs for the residential built environment. Providing a forum at a local level will allow a more diverse set of opinions. This would also provide a feedback loop to ASHRAE Society for action.

Following the Stakeholders Workshop, notes from each breakout session were uploaded to the RBC Basecamp. The Residential Building Committee and RBC Staff Liaison met and reviewed the efforts of the workshop. Stakeholder input will be used to help shape the ongoing work and priorities of the RBC and their recommendations to ASHRAE.

A detailed report of the workshop follows this Summary.

Respectfully submitted,

Carol Marriott
Chair
ASHRAE Residential Building Committee

Report

This report is organized as follows:

- Section 1: Workshop Overview/Structure
- Section 2: Results from Breakout Session 1 (Energy Affordability and Consumer Choice)
- Section 3: Results from Breakout Session 2 (Energy Reliability and Resilience)
- Section 4: Results of Breakout Session 3 (Indoor Environmental Quality)
- Appendix A: List of Attendees
- Appendix B: Workshop Agenda
- Appendix C: Stakeholders Input from All Three Sessions
- Appendix D: Recommendations for Future Stakeholder Events

SECTION 1: Workshop Overview/Structure

The third ASHRAE Residential Stakeholders Workshop was held at the 2025 Building XVI Conference in Clearwater, Florida. Invitations were extended to organizations currently listed in the RBC Strategic Plan. Twenty-four stakeholders attended the workshop. A list of attendees is included in Appendix A [Editor's Note: some participants came and went throughout the day and thus attendance fluctuated between 24 and 30 throughout the day].

The specific goals for the workshop included:

1. **Update Stakeholders:** Share progress on ASHRAE initiatives implemented since the last workshop, reflecting stakeholder input.
2. **Highlight Achievements:** Provide stakeholders an opportunity to present recent advancements in residential building performance.
3. **Collaborate on Future Actions:** Engage attendees to identify actionable steps ASHRAE can take to address market needs, including energy efficiency, indoor environmental quality, and workforce development.

Building on outcomes from the previous workshop, the discussion focused on:

- Strengthening ASHRAE's role as a trusted source for residential building performance.
- Defining what constitutes "high performance" residential buildings.
- Developing tools for assessing residential energy efficiency and economic viability.
- Leading efforts in codes, standards, and design guides for multi-family residential buildings.
- Enhancing collaboration between public and private entities in the residential sector.
- Addressing research gaps and translating technical information for diverse stakeholders.
- Supporting workforce development and training to meet residential building needs.

This workshop provided a platform for engagement, knowledge-sharing, and actionable planning to advance solutions for residential building performance.

To accomplish these objectives, the workshop format included a keynote speaker and three breakout sessions on the topics of Energy Affordability and Consumer Choice, Energy Reliability and Resilience, and Indoor Environmental Quality. The workshop concluded with a wrap-up and summary discussion on the priorities identified by attendees and speakers and suggestions for possible next steps.

The keynote speaker for the workshop was Bryan Orr, Vice President of Service at Kalos Services and host of the HVAC School Podcast. Bryan's keynote address explored the challenges and opportunities in workforce development for high-performance residential construction and retrofits. With insight grounded in years of hands-on experience, he focused on how to attract, train, and retain skilled workers to meet the evolving needs of the residential sector. Bryan identified gaps and challenges, laying the foundation for meaningful breakout discussions on how workforce engagement can drive innovation and elevate residential building performance.

Members of the RBC acted as recorders and facilitators for all three breakout sessions. Members of the committee were assisted by ASHRAE RBC Staff Liaison Derrick Nesfield from Peachtree Corners Headquarters, in organizing and conducting a most effective event.

The RBC met following the workshop to continue honing the input and recommendations from the workshop. Notes from the workshop are included in this report (Appendix C).

SECTION 2: Results from Breakout on Energy Affordability and Consumer Choice

ASHRAE Residential Buildings Committee (RBC) Workshop for Workforce and Industry Engagement was conducted as part of the Buildings XVI Conference. The workshop focused on energy affordability and consumer choice, energy reliability and resilience, indoor environmental quality (IEQ), workforce development, and equity considerations in residential buildings.

Stakeholder discussions highlighted that homeowners respond more strongly to messaging around comfort, health, reliability, and affordability than to energy efficiency metrics alone. Participants emphasized that consumer decision-making is emotional and shaped by socioeconomic conditions, geographic location, and perceived value.

Workforce development emerged as a cross-cutting theme, reinforcing keynote insights on the need to bridge technical expertise with real-world residential practice. Participants identified gaps in training consistency, limited field-based education, and misalignment between codes, standards, and climate-specific realities.

Equity, affordability, and access were repeatedly cited as foundational challenges. Stakeholders encouraged ASHRAE to strengthen its leadership role by advancing practical guidance, tools,

and standards that integrate energy efficiency, resilience, indoor environmental quality, and workforce readiness while addressing non-energy benefits such as health, comfort, and durability.

Energy Affordability & Consumer Choice – Key Themes:

Barriers to Consumer Adoption of Energy Efficiency

- Selling energy efficiency alone is ineffective.
- Comfort and health are not emphasized enough in messaging.
- Consumers focus on utility bills; efficiency must be framed from this perspective.
- Customers care more about 'energy effectiveness' than 'energy efficiency.'
- Energy efficiency is not perceived to increase home value.
- Trades are overly siloed; holistic approaches are needed.
- No clear market triggers motivate consumer investment.
- Standards often rely on simple payback rather than broader benefits.
- Limited coordination with insurance, realtors, and underwriters.
- Barriers vary by socioeconomic status and geography.
- Low energy costs reduce motivation for upgrades.
- Household decisions are emotional.
- Programs often do not substantiate payback claims.

Workforce Issues

- Existing workforce lacks direction on new technologies.
- Training is inconsistent and not field-based.
- Codes and standards are misaligned with climate realities.
- Most upgrades occur after emergency failures.
- Training is often theoretical rather than practical.

Equity, Affordability, and Access

- Many households cannot afford efficiency upgrades.
- Upfront costs are a major barrier.
- Limited access to trustworthy resources and financing.
- Energy efficiency and carbon reduction measures feel inaccessible.

SECTION 3: Results from Breakout on Energy Reliability and Resilience

RBC Workshop focused on energy reliability and residential resilience in the face of extreme weather events, including wildfires, hurricanes, heat waves, flooding, and extended power outages. Participants examined what fails during disasters, what matters most for occupant safety and continuity, and how residential buildings can be designed and retrofitted to improve survivability.

Key themes included the critical role of the building envelope, ventilation, backup power, water

management, and hardened HVAC systems. Stakeholders emphasized the need to define and standardize concepts such as passive survivability, resilience, and hardened residential construction in ways that are measurable, actionable, and scalable.

Participants identified significant gaps in codes, standards, insurance alignment, and workforce coordination. They encouraged ASHRAE to lead efforts in developing survivability metrics, integrating resilience into standards and guidance, supporting research for extreme conditions, and coordinating across industries to improve residential outcomes during and after disasters.

Energy Reliability and Resilience – Key Themes:

Wildfire and Smoke Events – What Fails

- Envelope failures leading to smoke infiltration and poor indoor air quality.
- Loss of power resulting in cascading system failures.
- Mechanical ventilation systems unable to operate during outages.
- Structural vulnerability to fire exposure.

Wildfire and Smoke – What Matters

- Clear escape paths and evacuation readiness.
- Maintaining acceptable indoor air quality during smoke events.
- Fire detection and alarm systems.
- Community sheltering options and backup power availability.

Key Stakeholders

- Homeowners
- Builders
- First responders
- Emergency management agencies
- Insurance providers
- Utilities
- Local government leaders

What Can Be Fixed at Scale

- HVAC, building envelope, and passive design strategies.
- Simple, clearly defined emergency or evacuation operating modes.
- Insurance and finance alignment using fire risk mapping and home labeling.
- Clear definitions of infrastructure and water security risks.
- Addressing gaps in codes and standards at the local government level.

Defining Resilience

- Ability of a building to survive with minimal damage during disasters.
- Maintenance of value and functionality over time.
- Low operational cost during extreme weather events.
- Ability to withstand fire, heat, flooding, and other hazards.
- Passive survivability during extended power outages.
- Durability and resistance to damage.

Hurricane and Flooding Events – Common Failures

- Roof and structural failures.
- Loss of power, water, gas, and refrigeration.
- Window and envelope failures.
- Breakdown of communication systems.
- Disruptions to transportation, fuel, and food supply.

Resilience – What Matters Most

- Backup power systems.
- Fortified structural systems including roof strapping and anchoring.
- Preparedness measures for food and water.
- Flood mitigation strategies such as sandbags, elevated structures, and pumps.
- Hardened HVAC equipment and elevated outdoor air intakes.
- Strong building codes and effective enforcement.
- Floodwater management including cisterns.
- Limits on impermeable surfaces.
- Use of thermal mass to maintain indoor temperatures.

Potential ASHRAE Actions

- Develop standards and metrics for residential survivability and resilience.
- Integrate resilience metrics with insurance data and risk analysis.
- Address codes and standards for existing homes and aging materials.
- Use post-disaster forensic data to inform future codes.
- Support research on products for extreme heat and health outcomes.
- Encourage incentives that promote residential resilience.
- Improve coordination of qualified construction trades.
- Develop standards for hardened and resilient HVAC equipment.

Section 4: Results of Breakout on Indoor Environmental Quality

RBC Stakeholder Workshop focused on indoor environmental quality (IEQ). Participants examined what IEQ is, its impact on everyday life, codes and standards that address IEQ, and knowledge gaps that need to be addressed.

Participants identified what impacts IEQ, who should be included in the overall IEQ conversation, and what actions ASHRAE can take to address these issues.

Indoor Environmental Quality - Key Themes:

What is IEQ?

- Indoor Environmental Quality (IEQ) is the overall condition of a building's interior, encompassing air quality, lighting, thermal comfort (temperature/humidity), acoustics, and overall occupant health and well-being, affecting productivity and comfort through factors like ventilation, pollutant control, natural light, and moisture management. Good IEQ, achieved through good HVAC, proper daylighting, moisture control, and low-emission materials, boosts health, focus, and building value, while poor IEQ stems from pollutants (VOCs, mold, dust), stuffiness, and bad lighting.

What influences IEQ?

- Neighbors
- Contractors
- Google
- YouTube
- Media Creators
- Homeowners/Occupants/Building Owners/Tenants
- Designers and Trade People
- Manufacturers
- Installers
- Pets
- Children
- HVAC Technicians
- IAQ monitors
- Better Business Bureaus
- Medical Professionals

Most Valued IEQ Factors (ranked most valued to least valued)

- Comfort
- Light
- Air Quality
- Sound

What data are we missing? (ranked highest to lowest)

- Health Impact Data

- Consumer Valuation of IEQ
- Other
- IAQ Field Data

What are ASHRAE's strengths related to IEQ?

- Experts in the organization
- Standard 55
- Existing IAQ and comfort standards
- Creating standards that carry weight
- Expertise in standards writing
- Strong connection to HVAC equipment manufacturers
- Manufacturer alliances
- Recognized reputation for integrity and science
- Ability to research and evaluate research
- Existing IEQ-related standards to build off of
- The ability to convene workshops around the world

Who should ASHRAE engage for the highest impact?

- Insurers/Underwriters
- Realtors
- Architects/Engineers
- Homeowners
- Manufacturers

Potential ASHRAE Actions

- Recruit different stakeholders to participate on committees
- Create events to engage different stakeholders
- Create new standard or expand scope of Stds 55 or 62
- Research?

What can be done immediately?

- More fieldwork and/or connecting fieldwork to the meeting rooms.
- Translate best practices to easy answers/best practices and illustrations.
- Ask questions of occupants and listen to answers.
- Research what exists globally about the subject.
- Connect ASHRAE with contractors that are willing to work alongside ASHRAE to connect the dots.
- Do ideation meetings locally and capture insights.
- Coordinate with local chapters.
- Create standards and regulations around product VOC levels.
- Consider an "ASHRAE Answers" series that regular people can use for (free?) advice and answers to home-related questions.
- Enroll interesting communicators/new media outlets.

- Explore HVAC as a service business model.
- Connect ASHRAE with community colleges that have a building science curriculum.
- Look at existing research from other organizations and see what gaps exist around IEQ.
- Keep the conversation going.

Appendix A: List of Attendees [Editor’s Note: some participants came and went throughout the day and thus attendance fluctuated between 24 and 30 throughout the day]

Name	Organization
Alice Rosenberg	Consortium for Energy Efficiency
Amy Royden-Bloom	USDOE
Asa Foss	USDOE
Xudong Wang	AHRI
Robin Vieira	FSEC
Sam Rashkin	ORNL
Michael Lubliner	ORNL
Jonathan Bean	University of Arizona/SBSE
Iain Walker	LBNL
Urmilla Jokhu-Sowell	National Glass Association
Cardice Howard	RESNET
Doug Cochrane	DL
Walter Robison	Air Duct Council
Martin Dieryckx	Daikin Europe NV
Eric Kaiser	Tru Tech Tools
Stacey Rothgeb	NREL
Bryan Orr	Kalos Services
Ahmed Alqaisi	City of DeSoto - Development Services
Wahid Maref	Ecole de Technologie Superieure (ETS)
Olof Sven Mundt-Petersen	Swedish Federation of Wood and Furniture Industry & Lund University
Meghan Kathleeen Sylvia	Frontier Energy
Paulo Cesar Tabares Velasco	Colorado School of Mines
Andre Desjarlais	Oak Ridge National Lab
Andrea Giovanni Mainini	Politecnico di Milano
Abdulfattah Mohammed Almasehali	MUST
Husnain Alvi	Mirpur
Alexander Zhivov	USACE
Elly Trinh	King County
Ahmed Boubker Boudayah	University of Nottingham
Ahmed Sadek	Dar Al Handasah
Collin Olson	Energy Conservatory
Chrissi Antonopoulos	PNNL (RBC)
Darcy Carbone	Carbone and Associates (RBC)
Wes Davis	ACCA (RBC)
Jingjuan “Dove” Feng	2050 Partners (RBC)
Kimberly Llewellyn	Blue Rabbit Consulting (RBC)
Derrick Nesfield	ASHRAE Staff

Appendix B: Workshop Agenda**Buildings XVI ASHRAE Residential Buildings Committee
Workshop for Workforce and Industry Engagement****Event Overview:**

- Date: Sunday, December 7, 2025, from 8:30 AM – 4:00 PM EST
- Location: Beach Room (Lobby Level) at Clearwater Beach Sheraton Resort on Sand Key in Clearwater Beach, Florida (as part of the Buildings XVI Conference, Dec 8-11, 2025)
- Objective: Encourage robust discussion, foster meaningful relationships, and provide actionable insights on residential building challenges and solutions.

1.1.1 Workshop Schedule:

<i>Time</i>	<i>Activity</i>
8:30-8:45	Registration & Welcome Remarks
8:45-9:45	Keynote Address: Bryan Orr – Challenges and Opportunities for Home-Performance Residential Construction
9:45-10:00	Break
10:00-11:30	Session 1: Energy Affordability & Consumer Choice
11:30-12:30	Lunch
12:30-2:00	Session 2: Energy Reliability & Resilience
2:00-2:15	Break
2:15-3:45	Session 3: Indoor Environmental Quality
3:30-4:00	Wrap-up & Summary Discussions

Appendix C: Stakeholders Input from All Three Sessions

Session 1: Energy Affordability & Consumer Choice

Energy Efficiency:

- R&D on humidity control systems for low sensible load homes in humid climates (use results from 90.2, 62.2, etc.)
- Demonstrative and quantitative savings associated with upgrades, especially for in-field installations.
- ASHRAE Education training.
- Listen to people, techs, installers and crafts people who care.

Workforce:

- Clean house on standards.
- Training courses for new technologies.
- Awareness education training
- Make standards separate from guidance to achieve standards.[Editor's Note: the terms Standards and Guidelines are not well differentiated in the industry, and the language used in them is not always well understood]
- Create language and standards on field time, field outreach and hire more consultants from the field.

Equity, Affordability, and Access:

- Partner with organizations such as Habitat for Humanity to do low cost fixes to homes.
- Research on energy optimal levels for each climate zone.
- Guidance on impact in each climate zone.
- Education awareness
- Government Affairs
- Standards for non-energy impacts
 - Thermal comfort
 - IAQ
 - Quantification that programs can use in TRMS (more like 62.2)
- Show a real-life example besides data. Tell a story.
- Communicate and work with other standards organizations to make a unified process with a defined end goal.
- Encourage investment in building envelopes first then systems.
- RBC: validation of future AI-enabled code interpretation.
- Promote dew point and demand ventilation strategies regardless of energy.
- Research into delivering energy efficiency and decarb much more cost effectively.

Session 2: Energy Reliability and Resilience

- Develop standards and metrics for residential survivability and resilience.

- Integrate resilience metrics with insurance data and risk analysis.
- Address codes and standards for existing homes and aging materials.
- Use post-disaster forensic data to inform future codes.
- Support research on products for extreme heat and health outcomes.
- Encourage incentives that promote residential resilience.
- Improve coordination of qualified construction trades.
- Develop standards for hardened and resilient HVAC equipment.

Session 3: Indoor Environmental Quality (IEQ)

- Recruit different stakeholders to participate on committees
- Create events to engage different stakeholders
- Create new standard or expand scope of Stds 55 or 62
- Research

Appendix D: Recommendations for Future Stakeholder Events

- To achieve greater attendance, consider hosting at conferences more dedicated to the residential built environment for example;
 - New residential construction: EEBA <https://summit.eeba.org/>
 - Existing buildings: NHPC <https://building-performance.org/events/national/>
- Host local stakeholder workshops (regional or chapter) to gain a more diverse feedback from a wider audience. Many parts of the world have differing needs for the residential built environment. Providing a forum at a local level will allow a more diverse set of opinions [Editor's Note: Has been submitted for PAOE points]
- Update focus topics on current industry events as needed



**ACTION ITEMS
GOVERNMENT AFFAIRS COMMITTEE
SY 2025-2026**

Last Updated: April 8, 2026

#	Action	Assigned To	Due Date	Status	C/O
<i>Continued from SY2024-25</i>					
1	Create video to show how to fill out and submit a GOE form. This video will be imbedded in the CRC GAC Training as well as the GOE training.	Staff (Karson)	Summer 2025	Completed and posted to the GovAffairs Advocacy Toolkit webpage: https://www.ashrae.org/about/government-affairs/member-resources-advocacy-toolkit	C
<i>Added at Oct. 23, 2025 Fall Meeting</i>					
2	Share advocacy resources (trainings and accompanying slides, presentations, collateral packets) with the EHC advocacy subcommittee	Staff	ASAP	Yates sent to EHC on 10-23-2025.	C
3	Send poll to GAC members to ask about dinner preferences for the Winter meeting in Vegas (close to hotel @ approx. \$100 dinner costs vs. 15-minute uber drive from hotel @ approx. \$60 dinner costs)	Staff	ASAP	Miller sent poll on 10-24-2025.	C
<i>Added at Jan. 30, 2026 Winter Meeting</i>					
4	Work with GASC to recommend one Region for a concentrated government outreach program (and recommend any financial requirements needed to carry out the program); this region could be used as a demonstration for other international regions.	Luis	June 2026	Discussion with GASC chair on this item is ongoing.	O
5	Add photos from Romanian Ambassador meeting to the next “year in review” GOE video.	Staff (Jacob)	Fall 2026	In Progress - Staff are compiling photos, including the meeting with Ambassador Gitman, to use in this year’s EOY video.	O
6	Draft a motion to add the award criteria and scoring mechanism for the Gov Affairs Society-level award to the Resource Manual.	Staff (Emily)	Spring mtg	In Progress.	O



#	Action	Assigned To	Due Date	Status	C/O
7	Share with the GAC the Building Code Assessment Tool (BCAT) developed by the CEBD. This tool could be used in your region, as the CEBD could help in hosting a BCAT workshop in your region. https://www.ashrae.org/technical-resources/cebd-center-of-excellence-for-building-decarbonization	Staff	ASAP		C
8	Include Planning Committee Emerging Technologies document (agenda item #15-a) in the Winter 2026 Meeting minutes.	Staff	Mid-Feb.		C
9	Develop a chapter-generic template/documentation to facilitate encouraging chapter members to attend DOTH events.	Staff (Jacob)	Feb.	In progress – The Marketing Department has created a ‘frame’ for LinkedIn posts and a template flyer for chapters to use to internally advertise GOEs. Staff to distribute these new resources, add them to training files, and write SOP.	O
<i>Added after March 16 GAC Executive Subcommittee Meeting</i>					
10	Review the Govt Affairs section of the Manual of Chapter Operations, and make any suggestions; please send suggestions to Mick.	All RVCs	Spring 2026 (Note: updated deadline)	This action item has been expanded to additional documents: - Manual of Chapter Operations – GovAffairs Section - Reginal Operations Manual - CRC Manual These documents are posted in Basecamp – in the folder labeled “Key Resources,” subfolder “GAC Governing Documents,” sub-sub-folder “Members Council Governing Documents – Word Versions”	O
<i>Added at the April 8 GAC Spring Meeting</i>					
11	Review Bill McQuade’s comments on the climate change PD to determine if the Climate Change PPIB needs to be further revised.	Staff	Mid-April		
12	Send GAC-approved revised PPIBs to Tech Council for their review and comments, per the ROB.	Staff	ASAP		



#	Action	Assigned To	Due Date	Status	C/O
13	Share DRAFT PAOEs for SY26-27 with the GAC – which may address the points awarded for multi-meeting GOEs (e.g., DOTH)	Mick Schwedler	April 10		
14	Share recommendations on PAOE with your subcommittees and/or the GAC Vice Chair, per the GAC MOP.	All GAC Members	Fall/October 2026		
15	Review Andy Persily's edits to the IAQ PPIB and make a recommendation to the GAC Chair.		Mid-April	The group identified to do this is Andy Persily, Adrienne Mitani, and Neil Gavigan. PJ Johnston volunteered to also be involved, and Alice requested to stay informed. Status: Meeting is being set up.	