MEETING NOTES
ASHRAE 2024/25 CEBD

Sunday, February 9, 2025 8:00 AM – 10:00 AM EST
ASHRAE Winter Conference 2025 – Orlando, FL – Hilton, Orange D (Lower Level)

1. Call to Order – Kent
2. ASHRAE Values Statement - Kent

   ASHRAE Values 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.
3. Review of Agenda – Kent
4. CEBD Introductions and sign-in sheets
   a. Quorum (Absent: Ginger) – Approx. 43 guests in-person and virtual
   b. Position and goals review
5. TFBD/CEBD Update –Kent
   a. Overview of transition – accomplishments, outstanding items, plan items to be initiated
6. Decarbonization Guide Update –Blake
   a. Provided quick review of complete technical guides.
   b. *Whole Life Carbon Guide for Building Systems* – April 2025
   c. *Building Decarbonization Retrofits for Commercial and Multifamily Buildings* –
   d. *Decarbonizing Building Thermal Systems: A Guide for Applying Heat Pumps and Beyond* – Version 2 - Still planning to be available Q2
   e. CEBD-USGBC *Guide to Strategic Decarbonization Planning* – Adam Hinge presented an overview of this guide -Anticipated publishing by April/May 2025
7. Decarbonization Training Update –Jeremy
   a. Provided an overview of complete education/training courses.
   b. Decarbonizing Hospital Buildings – In final stages
   c. Decarbonizing Building Thermal Systems – In final stages
   d. Building Decarbonization Retrofits for Commercial and Multifamily Buildings – Soon to be initiated
8. New Decarb 45m Chapter Seminars and PowerPoint templates - Ghina
   a. Discussion of the development of on-demand introductory topical webinars.
   b. 4 topics: Cold-Climate, Beneficial Electrification, WLC
9. Decarbonize ASHRAE Standards –Bing

a. Overview of how standards strengthen efforts toward decarbonizing the built environment.

b. Brief overview of harmonizing ASHRAE standards.

- Std 90.1, 90.2, 100, 211, 240P, 242P, 244P.
- Expanding standards to include GHG reduction, TPS impacts .
- Change of project title.
- Kent's vision is that all the standards are harmonized (not just carbon-related) across ASHRAE.

10. CEBD Website –Carrie

a. Overview of CEBD landing pages and encouraged access to technical resources, including the CDP cert.

11. ASHRAE Decarbonization Conferences –Adam & Luke

a. Adam shared the success of NYC Decarb 2024 sold out event

b. Topical sponsorship topped out.

c. Presentation of award to Adam.

d. Next event: Oct 22-24 in Chicago; Panel/Seminar deadline Feb 14, 2025.

12. Global Advisory Panel –Clay

a. Description of code development and need, globally, for a basic standard.

b. Focus on EE and RenewE+, Resilience and Decarb in emerging markets.

c. We are meeting tomorrow afternoon.

13. ASHRAE Member Needs Survey Results –Clay

a. Strategic planning session revealed the need to understand what our members need.

b. Discussed how Ginger helped place specific questions within the member survey.

c. A large majority of respondents were supportive of prioritizing decarb within ASHRAE.

d. Slides will be uploaded to Conference resources.

e. Data will be used to inform future education/training technical resources.

f. Future CEBD Planning Session will include developing shorter education and alternative training opportunities.

g. Overview of Decarb strategy game training and education priority results.

h. YEA did a deep dive into the game – much more interested in project planning; more focused on LowGWP refrigerants, IAQ management. Life cycle emissions

and low-carbon were not a high priority. (Do they not know about it or is it simply not a priority?)

14. Project Updates – Project List and Primer Doc for TechC on OneHub
    a. Flexible Int'l Bldg Code Framework –Clay/Ghina
        - 2 years in development. Launched with NIEA in Oct 2024 and pilot in Fall 2025. Call for participation.
        - The framework has evolved into a facilitated session with stakeholders present and identifying priorities for building code needs. 35 stakeholders of various sectors. Ranking the difficulty of code development and deployment.
    b. HVAC Eqpt Service Life Data –Blake/Kent
        - Explained the dire need for updated info (much of the equipment is no longer produced, and new tech is not ranked). Currently with RAC and responding to comments.
    c. Whole Life Carbon Gap Analysis –Ghina/Carrie
        - Review of need, complexity of WLC and project goals.
    d. Standardizing WLC Calcs for Bldg Systems –Luke/Ghina
        - Described current carbon requirements in China for Scope 1,2,3 and the stringency of those. ASHRAE does not have a guide for meeting these stringent requirements. Will be working with WLC analysis team to create the guide.
    e. Whole Bldg/MEP Benchmarking–Ghina/Kayleigh/Luke (Kayleigh presented)
        - Goals is to use the data to develop a std and framework for benchmarking WLC across sectors.
    f. Residential Retrofits –Carrie/Clay
        - Collect existing resources and create a complete reference resource.
    g. Decarb Strategies for Supermarkets –Rajan
        - Overview of the complexity of SMKT needs and systems. WG established to prioritize needs and project outcomes
        - Meeting on Tuesday morning.
    h. Refrigerant Emissions –Stet
        - Explained the complexity of systems and data gaps – especially for large portfolio owners. Project is aimed at building a resource across building types using anonymous data collection path and getting a better, more informed info to the portfolio owners.
    i. Decarb Framework for Data Centers
        - Discussion of overload of systems and high impact of global data center operations. Goal is to approach centers with efficiency and carbon reduction. Other groups are concerned with this: 9.9, 90.4
        - Call for participation from industry experts.
    j. Kent provided an overview of prioritization process and that the above projects are a result of the previous cycle. Now, the process will be repeated, and the

next steps will be following these projects to fruition and develop a new line of projects coming forward.

15. A3 Refrigerants Update – Stet
    a. Over the last year and half, CEBD, UL, OEMs, Fire Marshalls, CARB, etc. have met to frame a roadmap for industry collaboration.
    b. Four meetings of working groups – risk assessment was completed, stakeholders were identified, charge limit options were identified, and A3 was expanded from commercial to residential. The outward focus of a $6M project is to look at the whole life cycle of refrigerants.
    c. Given the current political climate, the states will strongly push to get this going.
16. MEP 2040 Update –Kayleigh
    a. How to measure the parts of MEP systems as there is not cohesive guidance available on WLC measurements for this nor a space to benchmark this information and normalize over sectors.
    b. Architecture 2030 – strategic partnerships: Echo project.
17. AHRI Decarb Update –Jamie
    a. Setting up a program (as the operator) to assess existing industry resources and prioritize product groups.
    b. Call for participants.
18. Budget Update –Kent
    a. Review of budget, CEBD savings of $1.1M and support from both the Finance Committee and EXCom. Our future budget request will be reviewed by BOD this afternoon.
19. CEBD Budget Request –Blake
    a. Asking for $1.411M (savings plus and an additional $288, 645).
20. Closing Comments –Kent
    a. Kent expressed how amazed he is at what volunteers can accomplish. He described the need for more research to better inform future technical guides, education, and training resources. He also thanked the CEBD members and staff for their ability to keep the pace.
21. Open Discussion for Guest Comments:
    a. LCA and Decarbonization:
        - Life Cycle Assessment (LCA) is not the same as decarbonization.
        - LCA should not obscure the Life Cycle Carbon Performance (LCCP); transparency is crucial.

b. Cost Barriers:
    - If renewable energy solutions were cheaper, they would already be more widely adopted.
    - Cost estimators must align their prescriptions to ensure they do not unintentionally hinder implementation.

c. Social Sustainability:
    - Affordable, actionable solutions (e.g., smart thermostats, LED lighting) are critical to building community confidence in decarbonization efforts.
    - Social sustainability must complement technical solutions to ensure widespread adoption with a focus on society-wide benefits.

d. Resources and Collaboration:
    - ASHRAE Website: Improve accessibility to resources, including better website visuals (e.g., "we are heading in the right direction" graphics).
    - Collaborate with key organizations like the World Health Organization (WHO) to broaden impact, especially for healthcare facilities and of Zero Carbon Hospitals (existing HC) resources.
    - Provide more transparency for accessing committee public meetings and updates.

e. Harmonization and Standards:
    - Standardize methods for building carbon emission calculations and harmonize them across sectors.
    - Reference existing standards, such as ASHRAE Standard 189.1 (Standard for the Design of High-Performance Green Buildings, Except Low-Rise Residential Buildings), to guide implementation.
    - Continued responsible ownership and coordination among standard committee chairs.

f. Electrification Challenges:
    - Heating with electrification can result in significant upfront costs, though load reduction strategies can help mitigate these expenses.
    - Financial feasibility is often the key barrier to implementation.

g. Resilience Considerations:
    - Focus on resilience, including on-site energy generation and storage (e.g., standards from IEEE and NFPA).
    - Hospitals and similar critical facilities need tailored solutions to balance resilience and decarbonization.

h. Community Engagement:
    - Open meetings to the public and provide clear guidance on how they can access and participate in these discussions.

- Address responsibility for implementation to reduce complexity and ensure accountability.
- Engage manufacturers. Example of creating a high-end housing development as a testing ground/model showcase for heating solutions that are designed for better IAQ to gain market approval.

i. A3 refrigerants and Thermal Heat Pumps:

- Need to share transition successes.
- Support expansion for residential – there is a need for a variety of decarb options across sectors that are affordable to implement.
- Expand guidance on passive systems, thermal heat pumps, and in-flow (evaporative) heating and cooling.

22. Next CEBD Meeting: **Friday, February 28th, 2025 @ 3-4PM**
23. Adjourn

Attachment A

TFBD Action Items June 23, 2024, Meeting			
AI#	**Responsibility**	**Status**	**Description**
210	Bing	Open	Set up a meeting with Kent, Luke, representation from MEP2040, and DOE to discuss collaboration and funding support for benchmarking and MEP EPDs.

CEBD Action Items October 11, 2024, Meeting			
AI#	**Responsibility**	**Status**	**Description**
31	Kent	Open	Discuss with publication staff to standardize use of “decarbonization” concepts and possible need for an educational one-page explanation of the whole building approach, whole life decarbonization, and differences between decarb and net zero.

CEBD Action Items November 8, 2024, Meeting			
AI#	**Responsibility**	**Status**	**Description**
36	Leigh Lain Walker	Complete	Coordinate with ASHRAE Marketing on a final review and clean-up of presentations. CEBD template on Onehub.

CEBD Action Items January 3, 2025, Meeting			
AI#	**Responsibility**	**Status**	**Description**
50	Ghina	Ongoing	Check if it is possible to convene a group of YEA members in Orlando.
53	Blake/Kent/Leigh Lain	Complete	Blake and Kent to draft project priority list with budget/timeline and share with CEBD and Leigh Lain will share with ASHRAE Development team.
56	All	Open	Please review CEBD Interest table and email Blake your recommendations for the next year's roster.

CEBD Action Items January 17, 2025, Meeting			
AI#	**Responsibility**	**Status**	**Description**
57	Jeremy	Open	Encourage Heatspring to wrap up other coursework and initiate Building Decarbonization Retrofits for Commercial and Multifamily Buildings in February using latest guide.
59	CEBD	Open	Assist with an update of GAC PowerPoint slides by mid-February.
60	Kent	Complete	Draft CEBD agenda and slide format for Orlando.
61	Leigh Lain/Stephanie	Complete	Draft Board ExCom report and share by the end of next week.

CEBD Action Items January 31, 2025, Meeting			
AI#	**Responsibility**	**Status**	**Description**
62	Kent	Complete	Update old TFBD slides (60-61) for Decarbonization Retrofit presentation.

CEBD Action Items January 31, 2025, Meeting			
AI#	**Responsibility**	**Status**	**Description**
63	Bill/Stet	Open	Bill to bring up Decarb Webinar option at Members Council and Stet offered to get a webinar cohort going for Decarb 101 teasers for chapters.
64	Bill/Blake	Complete	Bill and Blake offered to present and assist Bing in drafting slide for Data Centers.
65	All Presenters	Complete	Kent to share slides in Sharepoint. Jaime to provide slide info for AHRI update. Kayleigh to provide slide info for MEP 240. ALL to review slides, make necessary changes, and prepare 3 minute talking points.
66	Carrie/Kent	Open	Carrie to connect Kent to Bill Bishop in effort to draft a high level explanation of when and why to use the different GHG Protocol Scope Emissions.
67	Leigh Lain	Complete	Update CEBD site with publication info prior to Orlando.

MEETING NOTES
ASHRAE 2024/25 CEBD

ASHRAE Winter Conference 2025 Sessions relating to Decarbonization include:

Sunday, February 9, 2025

- Seminar 4: Decarbonizing at Scale: Strategies for a Sustainable Energy Future
- Seminar 5: Practical Progression and Implementation to Decarbonization
- Workshop 1: Energy-Efficient Buildings Connection to Integrated Power and Thermal Grids to Achieve Decarbonization Goals: Part 1
- Forum 1: Is Building Performance Standard Legislation a Pathway to Decarbonization?
- Seminar 13: Low and Ultra-low GWP Refrigerants and Equipment to comply with Current and Future Decarbonization Efforts
- Workshop 2: Energy-Efficient Buildings Connection to Integrated Power and Thermal Grids to Achieve Decarbonization Goals: Part 2

Monday, February 10, 2025

- Seminar 21: Decarbonization of Cleanrooms through More Effective Determination of Air Change Rates
- Seminar 27: Unlocking the Future: Breakthrough Field Results from DOE's Cold Climate Heat Pumps Challenge in Residential Decarbonization
- Panel 3: MEP 2040 Session
- Debate 1: Is ASHRAE on the Right Path? A College of the Fellows Debate on Decarbonization

Tuesday, February 11, 2025

- Seminar 34: Cutting-Edge Japanese Technologies on Decarbonization
- Seminar 46: Decarbonizing in Very-Cold Climates: Latest on Field and Modeling Efforts to Retrofit Communities in Extreme Climates
- Sponsor Tech Talks : Pathways to Net Zero: Decarbonizing Existing Buildings with Air-to-Water Heat Pumps presented by JCI

Wednesday, February 12, 2025

- Seminar 53: Building Decarbonization: Policy Goals, Performance Standards and Pathways for Optimizing Both Climate and Health

Center of Excellence for Building Decarbonization

2025 Orlando Winter Meeting

Agenda

1. Call to Order
2. ASHRAE Code of Ethics –Kent
3. Review of Agenda –Kent
4. CEBD Introductions and sign-in sheets
5. TFBD/CEBD Update –Kent
6. Decarbonization Guide Update –Blake
7. Decarbonization Training Update –Jeremy
8. New Decarb 45m Chapter Seminars –Ghina
9. Harmonize ASHRAE Standards –Bing
10. CEBD Website –Carrie
11. ASHRAE Decarbonization Conferences – Luke & Adam
12. Global Advisory Panel –Clay
13. ASHRAE Member Needs Survey Results –Clay
14. Project Updates
    a) Flexible Intl Bldg Code Framework –Clay/Ghina
    b) HVAC Eqpt Service Life Data –Blake/Kent
    c) Whole Life Carbon Gap Analysis –Ghina/Carrie
    d) Standardizing WLC Calcs for Bldg Systems –Luke/Ghina
    e) Whole Bldg/MEP Benchmarking–Ghina/Kayleigh/Luke
    f) Residential Retrofits –Carrie/Clay
    g) Decarb Strategies for Supermarkets –Rajan
    h) Refrigerant Emissions –Stet
    i) Decarb Framework for AI Data Centers – Bing/Blake
15. White House A3 Refrigerants Update – Stet
16. MEP 2040 Update –Kayleigh
17. AHRI Decarb Update –Jaime
18. Budget Update –Kent
19. CEBD Budget Request –Blake
20. Closing Comments –Kent
21. Open Session for Guest Comments
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ASHRAE Value Statement

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Introductions

Scan next slide or use QR code sheets in room to register attending

Sign-in Sheet

CEBD Update

Kent Peterson

ASHRAE's position…

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

Our goals…

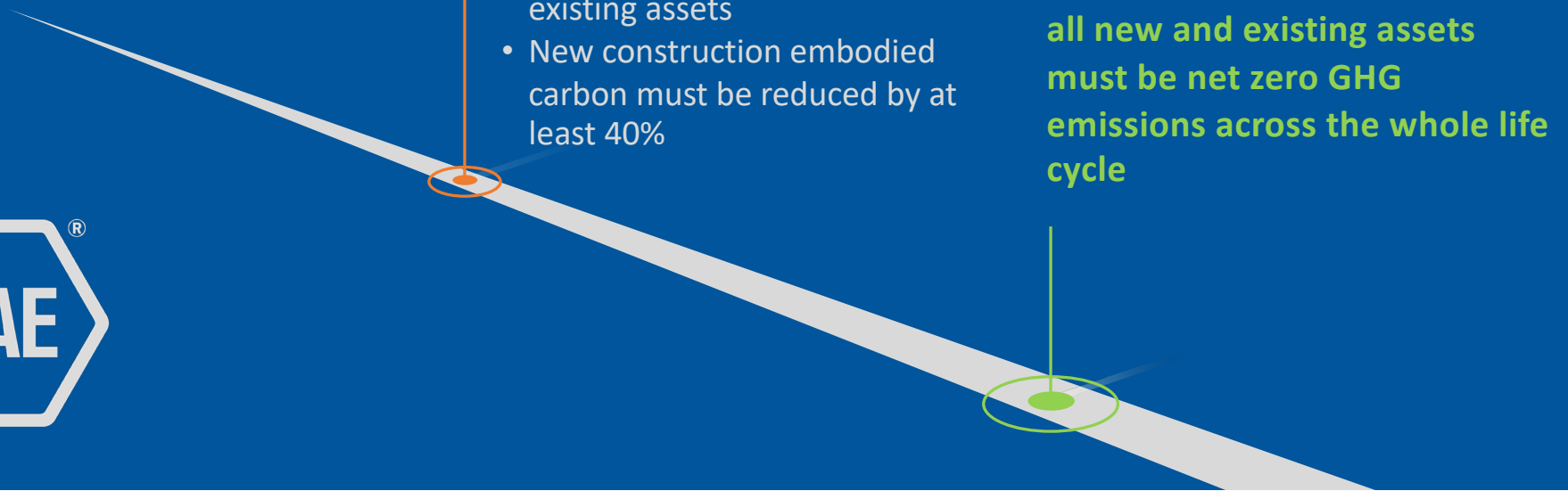
2030

the global built environment must halve its 2015 GHG emissions

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

2050

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



ASHRAE®

Four Key Focus Areas

June 2022 TFBD Plan Progress, SY 2022-23 and Beyond

One set of aligned carbon definitions *(now in ASHRAE Terminology)*

Guides

ASHRAE/DOE Building Performance Standards: A Technical Resource Guide

ASHRAE/DOE Decarbonizing Building Thermal Systems: A How-to Guide for Heat Pump Systems and Beyond

ASHRAE/ASHE Decarbonizing Hospital Buildings

ASHRAE Grid-Interactive Buildings: Design and Operation Resource Guide

ASHRAE/CIBSE TM65NA: Embodied Carbon in Building Services: A Calculation Methodology for North America

ASHRAE Building Decarbonization Retrofits for Commercial and Multifamily Buildings

- ❑ ASHRAE Whole Life Carbon Guide for Building Systems *(Final publication in Apr 2025)*
- ❑ ASHRAE/USGBC/NYSERDA Guide for Strategic Decarbonization Planning *(95% Review Draft)*

June 2022 TFBD Plan Progress, SY 2022-23 and Beyond

Training

Decarbonization 101 -45 minutes

Enhance the Existing 3-hour ALI Courses

Decarbonizing Hospital Buildings 3-hour course *(final review)*

Grid Interactive Buildings for Decarbonization 3-hour course *(completed)*

Heat Pump Application and Operation 3-hour course *(final review)*

- ❑ Building Decarbonization Retrofits for Commercial and Multifamily Buildings 3-hour course *(starting)*
- ❑ Building Decarbonization Audit full-day PDS

Building Decarbonization Design Professional Certification

June 2022 TFBD Plan Progress, SY 2022-23 and Beyond

Training

- Assist in Developing ASHRAE Building Decarbonization Conferences (2023 DC, 2024 Madrid, 2024 NYC)
- Building Decarbonization Game -45 minutes
- Decarbonization Retrofits -45 minutes
- Cold Climate Decarbonization Design -45 minutes
- Beneficial Electrification for Building Decarbonization -45 minutes
- How to Apply Whole Life Decarbonization Strategies to New Buildings -45 minutes

June 2022 TFBD Plan Progress, SY 2022-23 and Beyond

Standards

ASHRAE Standard 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings

ASHRAE Standard 90.2 Energy Efficient Design of Low-Rise Residential Buildings

ASHRAE Standard 100 Energy and Emissions Building Performance Standard for Existing Buildings

ASHRAE Standard 211 Commercial Building Energy Audits

ASHRAE/ICC Standard 240P Quantification of Life Cycle Greenhouse Gas Emissions of Buildings

ASHRAE Standard 242P Standard Method for Calculation of Building Operational Greenhouse Gas Emissions

ASHRAE Standard 244P Sustainability Assessment for Mechanical, Electrical, and Plumbing Products

Expediting other carbon-related standards

June 2022 TFBD Plan Progress, SY 2022-23 and Beyond

Outreach & Collaboration

Web site development ashrae.org/decarb

Social media 90-180s videos - Join us on the road to ZERO

Pivot in branding & marketing

Web site videos

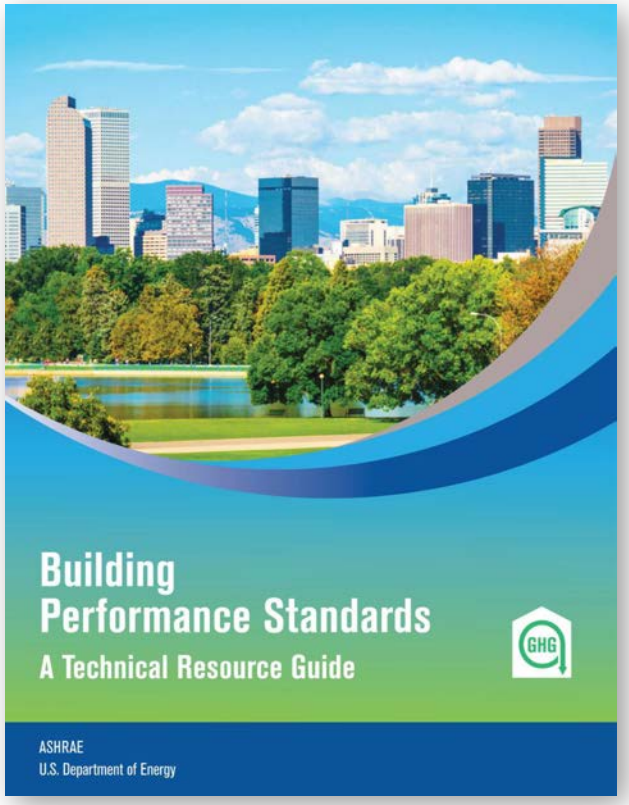
Coordination with GAC on decarbonization-related PPIBs and White House interaction

Creation of the ASHRAE Global Advisory Panel

Decarbonization Guides Update

Blake Ellis

Technical Guides Update

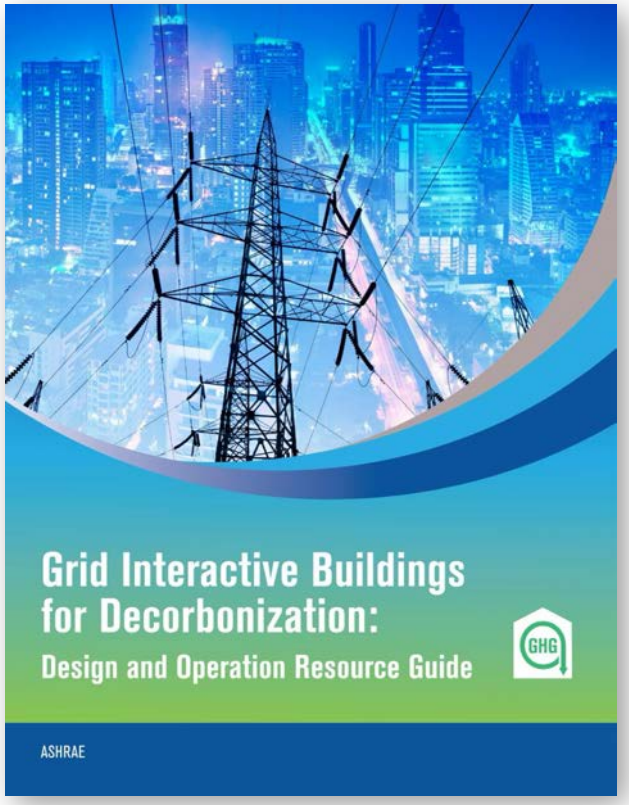


- **Guide:** *Building Performance Standards: A Technical Resource Guide*
- **Leads:** Adam Hinge, Andrea Mengual
- **Working Group:** Building Performance Standards WG
  - Developed in collaboration with the US Department of Energy (DOE)
  - WG continued from 2021-22
  - WG wrote entire guide (94 pages)
  - Guide is available for free download ***NOW***

    https://forms.ashrae.org/forms/PDFdownload_BuildingPerformanceStandards

COMPLETE

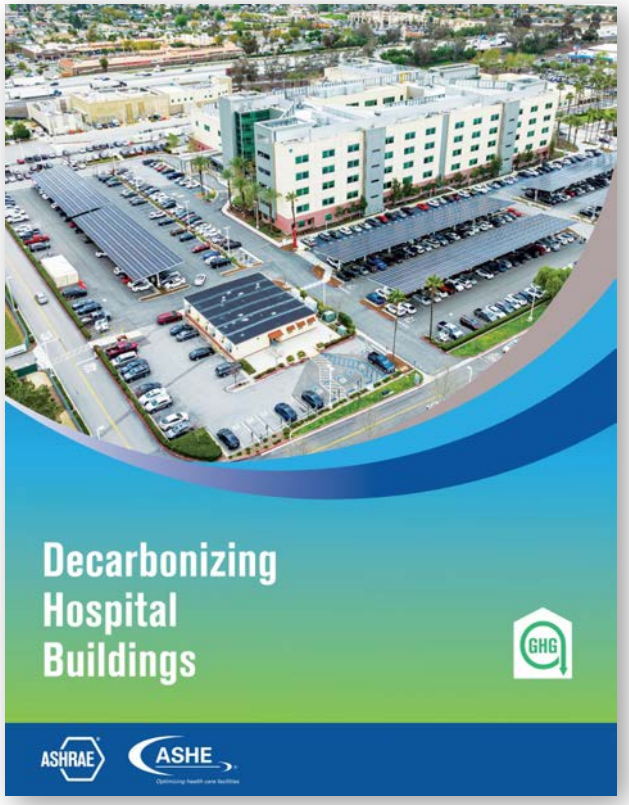
Technical Guides Update



- **Guide:** *Grid Interactive Buildings for Decarbonization: Design and Operation Resource Guide*
- **Lead:** Katherine Hammack
- **Working Group:** Grid Interactive Buildings WG
  - Contractor is New Buildings Institute
  - 60% & 90% drafts are complete
  - Next Activities:
    - Send to ASHRAE Publications in July 2023
    - Publication prior to the ASHRAE Decarbonization Conference in October 2023

COMPLETE

Technical Guides Update



- **Guide:** *Decarbonizing Hospital Buildings*
- **Lead:** Tim Peglow
- **Working Group:** Hospital WG
  - Developed in collaboration with ASHE
  - Contractor is Mazzetti
  - Sent to Publications in January 2024!
  - Next Activity:
    - Publication June 2024

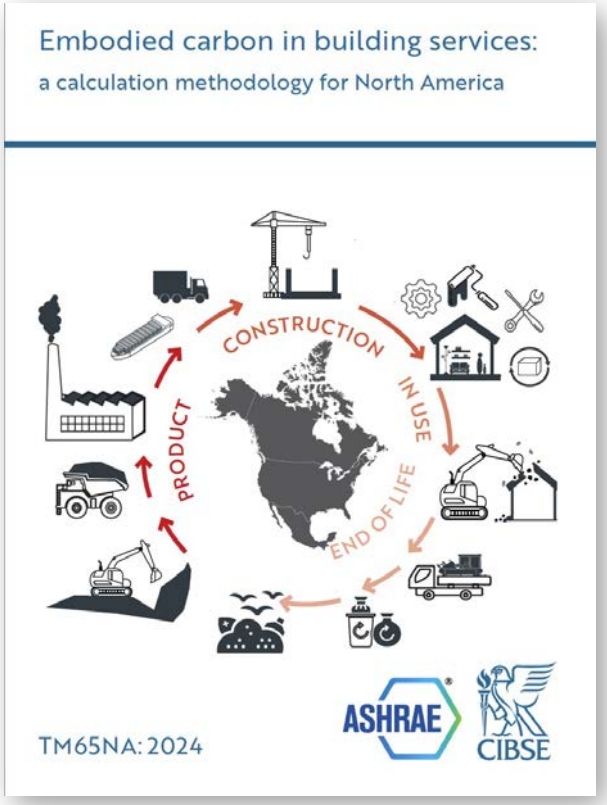
COMPLETE

Technical Guides Update

- **Guide:** *Decarbonizing Building Thermal Systems: A Guide for Applying Heat Pumps and Beyond*
- **Leads:** Mark Frankel (ASHRAE) / Paul Torcellini (NREL)
- **Working Group:** Heat Pump WG
  - Co-developing a guide w/DOE (NREL)
  - The guide is FREE
  - Next Activities
    - Publication (PDF) June 2024
    - **Expanded Guide** **Q2 2025**

COMPLETE

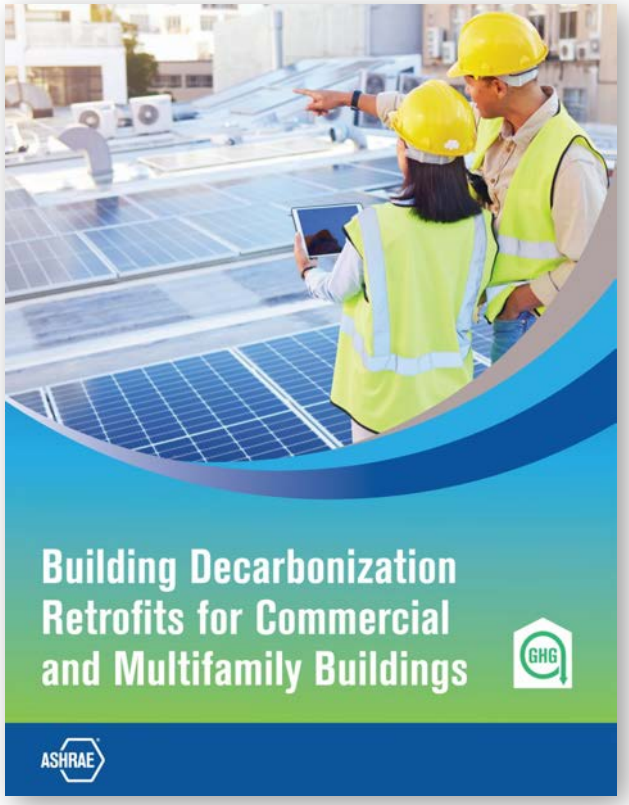
Technical Guides Update



- **Guide:** *TM65 for North America*
- **Lead:** Michael Deru & Louise Hammond
- **Working Group:** Whole Life Carbon WG
  - WG wrote the guide & met bi-weekly
  - Work is under an ASHRAE-CIBSE Agreement
    - CIBSE local amendment guidelines
    - Publication is by CIBSE
  - Next Activities:
    - Published October 2024

COMPLETE

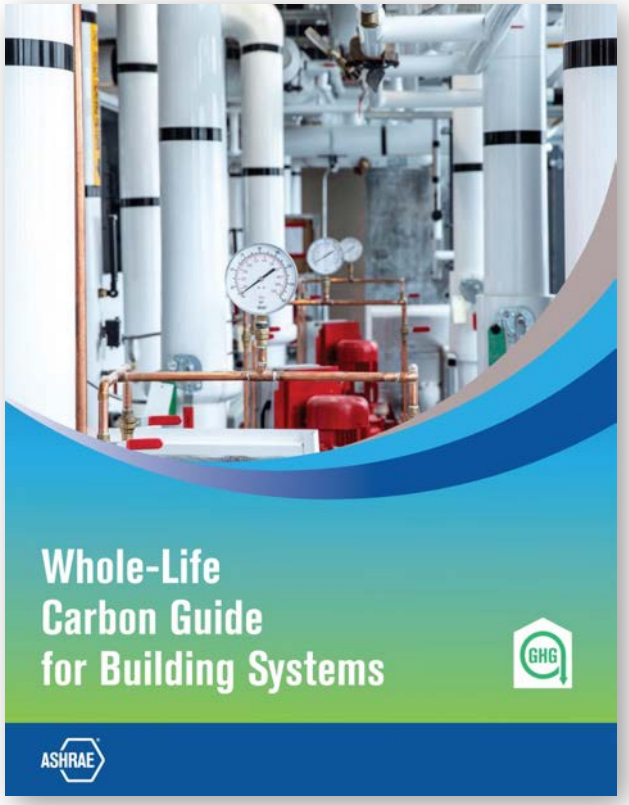
Technical Guides Update



- **Guide:** *Building Decarbonization Retrofits For Commercial and Multifamily Buildings*
- **Lead:** David Heinzerling
- **Working Group:** Retrofit WG
  - Contractor: *Frescott*
  - Next Activities:
    - 99% Complete — February 2024
    - To Publications — April 2024
    - Publication — February 2025

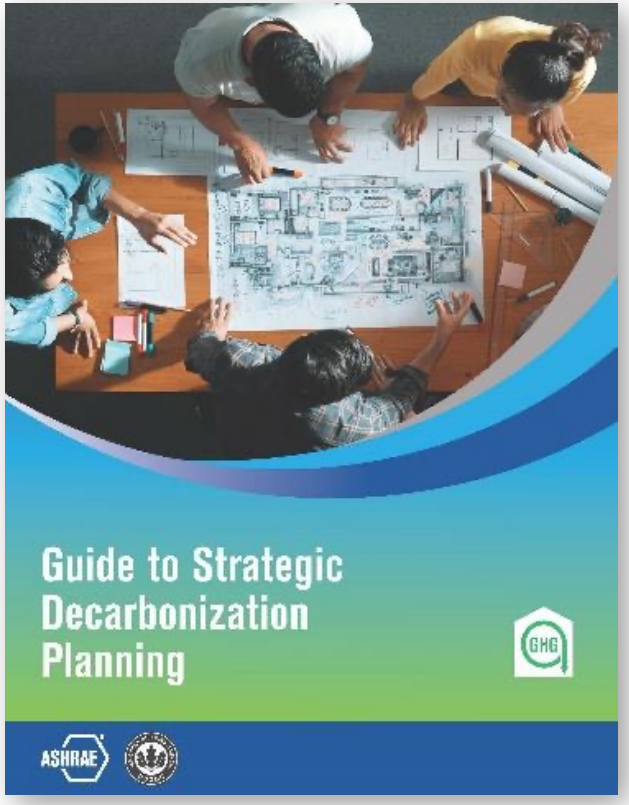
COMPLETE

Technical Guides Update



- **Guide:** *Whole Life Carbon Guide for Building Systems*
- **Lead:** Michael Deru
- **Working Group:** Whole Life Carbon WG
  - WG meets bi-weekly
  - The WG wrote the guide
  - Work Statement Approved
  - ~60% completed in June 2023
  - Next Activities
    - 90% Complete — March 2024
    - To Publications — January 2025
    - Publication — April 2025

Technical Guides Update



- **Guide:** ASHRAE/USGBC/NYSERDA Guide to Strategic Decarbonization Planning
- **Lead:** Adam Hinge
  - 95% completed in January 2025
  - Next Activities
    - Publication March 2025

Technical Guide Series Schedule

Jan 2023

- Building Performance Standards

Jul 2023

- Grid Interactive Buildings

Jan 2024

- Decarbonizing Hospital Buildings
- A Guide for Applying Heat Pumps

Jul 2024

- TM65 for North America

Jan 2025

- Building Decarbonization Retrofits
- Strategic Decarbonization Planning
- Whole Life Carbon

Jun 2025

- A Guide for Applying Heat Pumps *(Expanded)*

Decarbonization Training Update

Jeremy Smith

Education – Training

- Training Courses (3-hour)
  - Grid Interactive Buildings for Decarbonization: Design and Operation Resource Guide - **COMPLETE**
  - Decarbonizing Hospital Buildings – **Additional review in progress.**
  - Decarbonizing Building Thermal Systems: Applying Heat Pumps and Beyond – **Heatspring is finalizing latest revisions**
  - Building Decarbonization Retrofits for Commercial and Multifamily Buildings – **Not yet started**

Training Courses

Jul 2024

Grid Interactive Buildings

Jan 2025

Decarbonizing Building Thermal Systems: Applying Heat Pumps

Decarbonizing Hospital Buildings

Building Decarbonization Retrofits

Jul 2025

Jan 2026

Education – Training

- Future Courses
  - ALI Course on How to Apply Whole Life Decarbonization Strategies to New Building Design
  - Heat Pump Application and Operation
  - Building Decarbonization Audit

ASHRAE Learning Institute

45-minute Presentations

Ghina Annan

Decarbonization: Retrofitting Buildings, Reducing Emissions


ASHRAE
Cold-Climate
Decarbonization Design 101
CO_2
LCA
GHG


ASHRAE
Beneficial Electrification's Role
in Building Decarbonization
LCA
GHG


ASHRAE
Whole Life Carbon
Applying Strategies to New Buildings
CO2
LCA
GHG

Harmonize ASHRAE Standards

Bing Liu

ASHRAE Standards Addressing Decarbonization

- ✓ Strengthen the decarbonization components of ASHRAE standards, consistent with achieving a fully decarbonized built environment by 2050.
- ✓ Develop and revise guidelines and standards to reduce building GHG emissions while maintaining or improving building indoor environmental quality, sustainability, and resilience.

CEBD Progress

Coordinating with the standards project committees to address GHG emissions

Identifying the gaps to address both operational and embodied carbon standards

Harmonizing standards to respond to industry and members needs (GHG emission calcululation, GWP metrics etc.)

Harmonizing ASHRAE Standards

Standards

ASHRAE Standard 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings

ASHRAE Standard 90.2 Energy Efficient Design of Low-Rise Residential Buildings

ASHRAE Standard 100 Energy and Emissions Building Performance Standard for Existing Buildings

ASHRAE Standard 211 Commercial Building Energy Audits

ASHRAE/ICC Standard 240P Quantification of Life Cycle Greenhouse Gas Emissions of Buildings

ASHRAE Standard 242P Standard Method for Calculation of Building Operational Greenhouse Gas Emissions

ASHRAE Standard 244P Sustainability Assessment for Mechanical, Electrical, and Plumbing Products

Expediting other carbon-related standards

TFBD Website

Carrie Brown

Website & Knowledge Hub Working Group

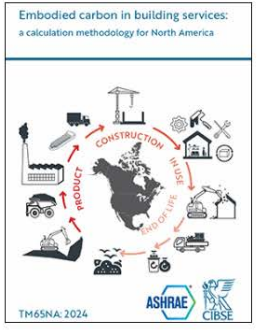
www.ashrae.org/decarb

Website & Knowledge Hub Working Group

Technical Resources:

Upcoming Guides | Papers and Proceedings | Standards | Position Documents

The CEBD, utilizing volunteers and outside contractors, is developing a series of seven decarbonization guides. The guides are tools for engineers, building operators, facility managers, design professionals and policy makers to decarbonize the building stock. Come back to see when the newest versions are available.



CIBSE TM65 for North America: The Chartered Institution of Building Services Engineers (CIBSE) developed and published *'TM65 Embodied carbon in building services: a calculation methodology'* in 2021. TM65 outlines the need for assessment of the embodied carbon of mechanical, electrical and plumbing (MEP) systems and guidance on how to estimate the embodied carbon of MEP products when environmental product declarations (EPDs) are not available. TM65 provides valuable guidance for the MEP community and beyond; however many of the method's inherent assumptions are specific to the United Kingdom (UK). There is a need for this type of guidance for other parts of the world, and CIBSE has developed a guidance 'Addendum' for adapting TM65 for other parts of the world: 'How to use TM65 outside the UK'. This guidance addendum defines how to create a regional TM65 addendum. The objective of this effort is to develop an addendum of TM65 for North America (Canada, USA, Mexico). Having a standard method for estimating the embodied carbon of MEP products that is consistent with a globally recognized approach will help fill in the missing gaps in embodied carbon data until more EPDs are available.

Website & Knowledge Hub Working Group

Training & Certification:

Certified Decarbonization Professional (CDP) | Training | Building Decarbonization Game

Certified Decarbonization Professional (CDP)

The CDP certification program validates competency of the decarbonization professional to do the following: Assess, analyze, and develop effective and sustainable strategies that reduce/eliminate the life-cycle carbon footprint of new and existing buildings. Learn more.

Training

ASHRAE currently offers an Introduction to Building Decarbonization training.

In addition, the following eLearning course is offered:

- Grid-Interactive Buildings for Decarbonization

www.ashrae.org/decarb

ASHRAE Decarbonization Conferences

Luke Leung & Adam Hinge

ASHRAE Conferences on Decarbonization

Think Globally…Act Locally

ASHRAE International Building Decarbonization Conference 2024

April 17-19, 2024

Madrid, Spain

ASHRAE Conferences on Decarbonization

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ASHRAE International Building Decarbonization Conference 2024

April 17-19, 2024

Madrid, Spain

2024 ASHRAE Decarbonization Conference

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MARK YOUR CALENDARS

Call for Proposals for Selected Topic of Interests

https://ashrae.org/conferences/topical-conferences/2025-ashrae-building-decarbonization-conference

Submit proposals for panel or seminar sessions (60 or 90 min):

Panel: 3-4 industry experts and one moderator

Seminar: 2-4 speakers and session chair

Deadline: Feb 14, 2025

Please ask Carrie Brown or Bing Liu for questions.

Global Advisory Panel

Clay Nesler

Global Advisory Panel Meeting – Winter 2025

- **Participants:**
  - ABRAVA, AHRI, AICARR, CIBSE, IIR, ISHRAE, NSPE, Phius, RHEVA, SWKI
- **Opportunities:**
  - Need a common net zero building definition for government adoption, but...
  - One size won't fit all – codes will require tailoring based on local needs and capacity
  - Identify countries with influence in specific, fast-growing regions (e.g., ASEAN)
  - Emphasize resilience in addition to building energy efficiency and decarbonization
  - Renewable energy is as important, and potentially easier, than energy efficiency
  - Allow for local innovation and design/construction practices (vernacular architecture)
  - Need genuine collaboration with Global South countries to co-create the framework
  - Challenge - how do we get the right people in the room?

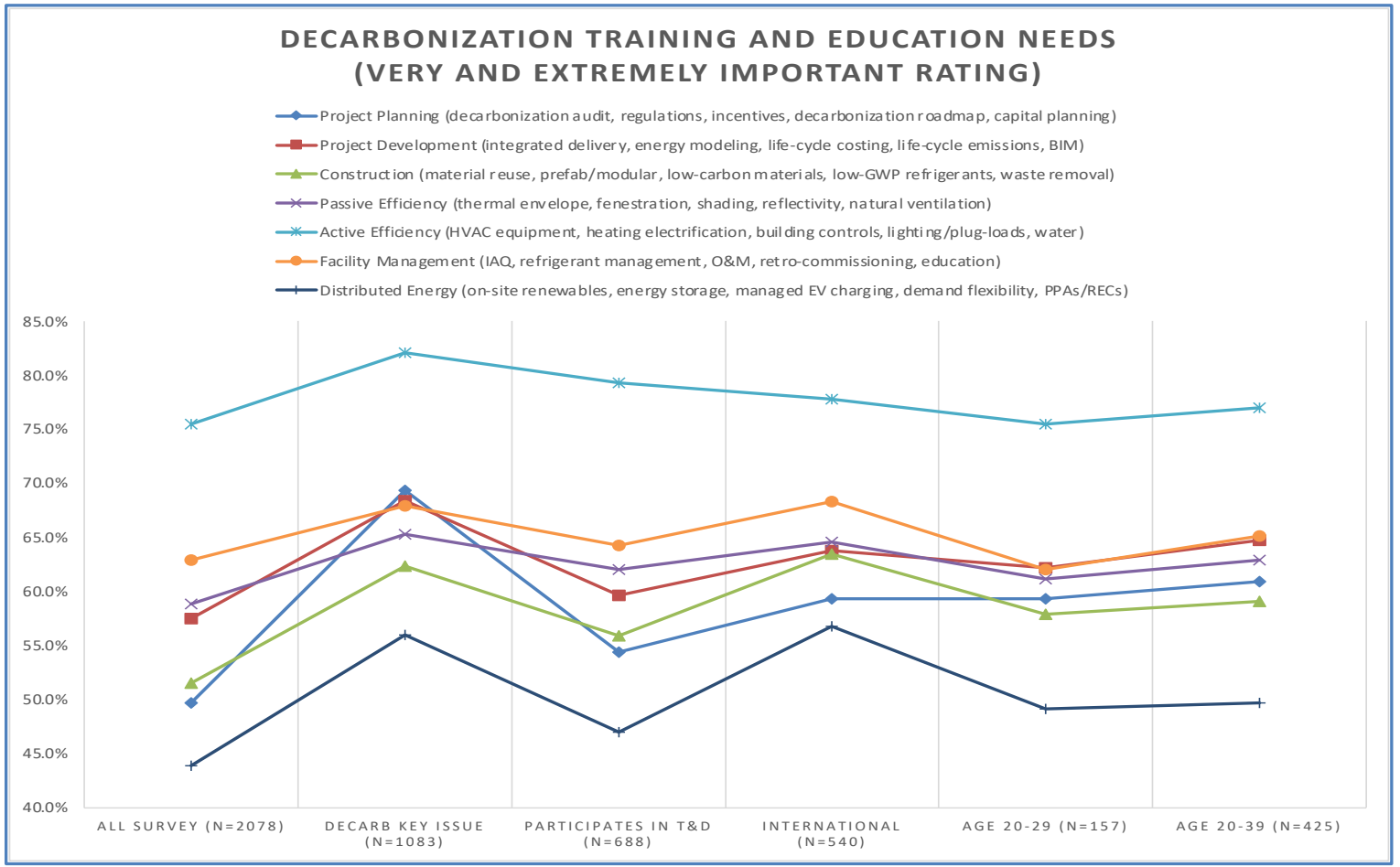
ASHRAE Member Needs Survey Results

Clay Nesler

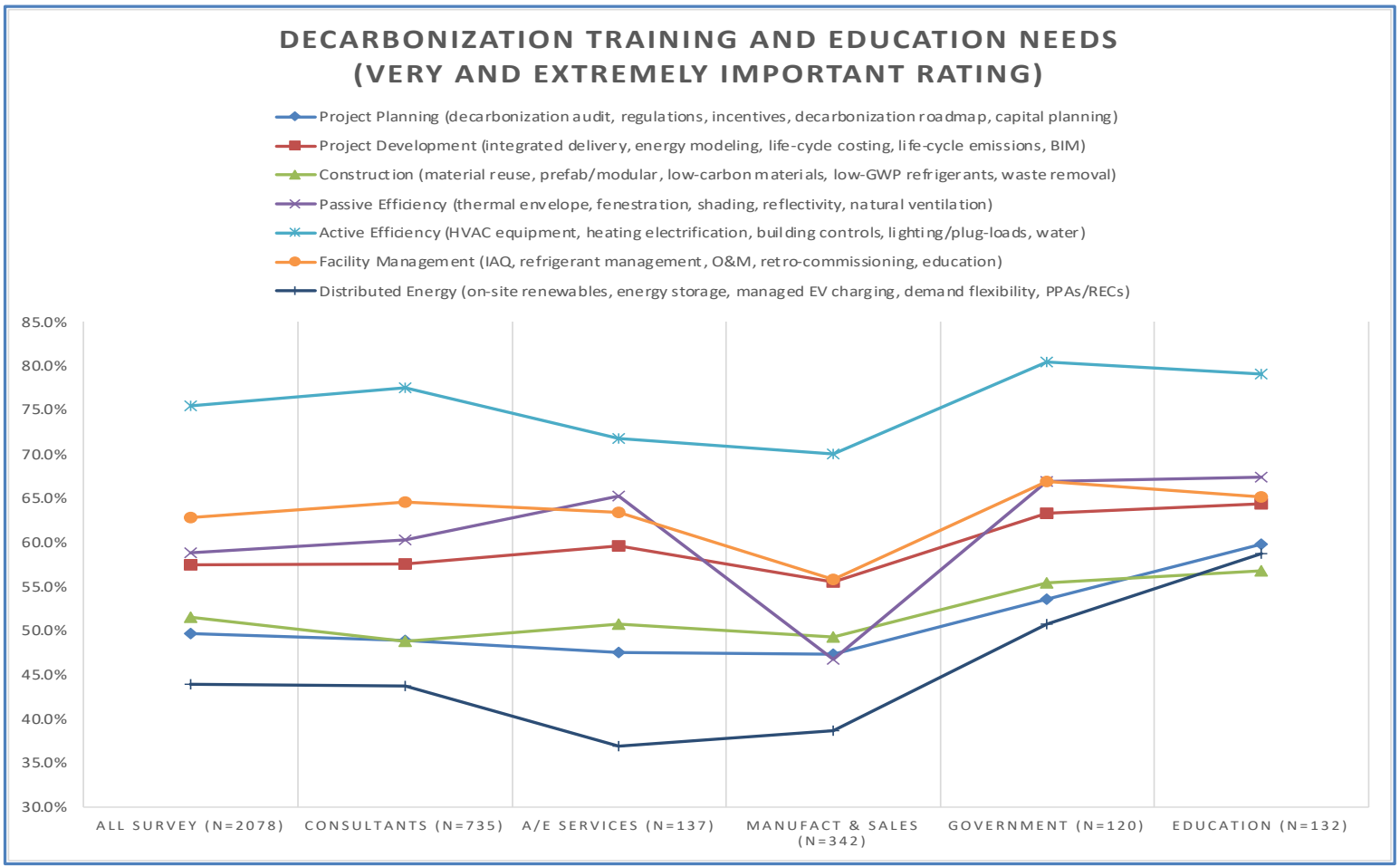
ASHRAE Member Satisfaction Survey
Research Highlights

- Active efficiency, facility management, passive efficiency and project development are the most important decarbonization topics, with more than 60% rating as very or extremely important.
- Government and education members rate project planning and distributed energy resources higher than other occupations.
- More international members rate decarbonization and climate change as a strategic industry issue more than any other segment (greater than 60%).
- More than 50% of younger (<39 years old), government and education members rate decarbonization as a strategic industry issue.
- Printed/digital documents and professional development courses are the highest rated training and education delivery methods for all segments.
- Over a third ranked 15-25 minute educational videos as one of their top two delivery methods, especially younger members, manufacturing/sales and education.

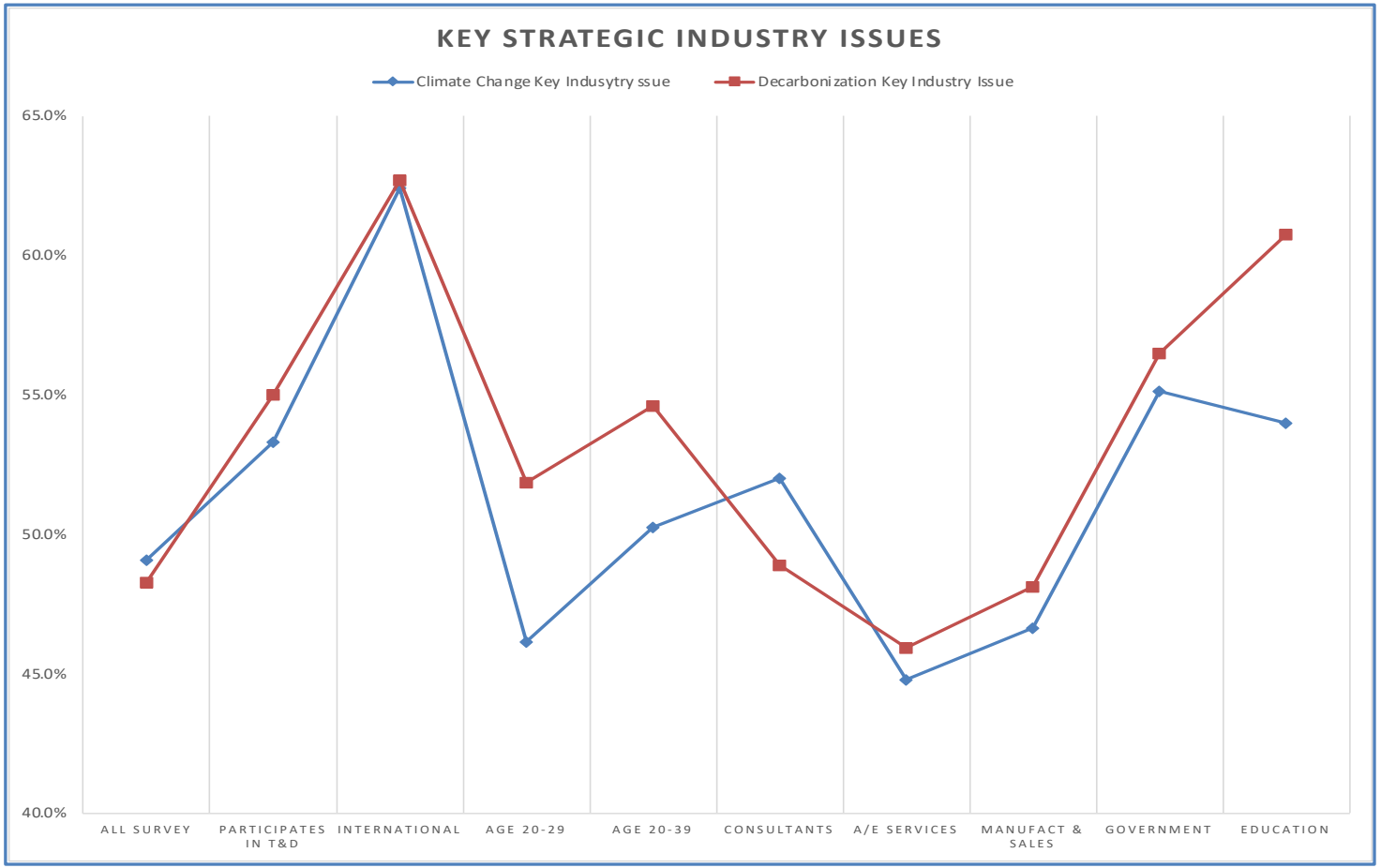
ASHRAE Member Satisfaction Survey
Decarbonization Training & Education Priorities



ASHRAE Member Satisfaction Survey
Decarbonization Training & Education Priorities



ASHRAE Member Satisfaction Survey
Decarbonization Training & Education Priorities



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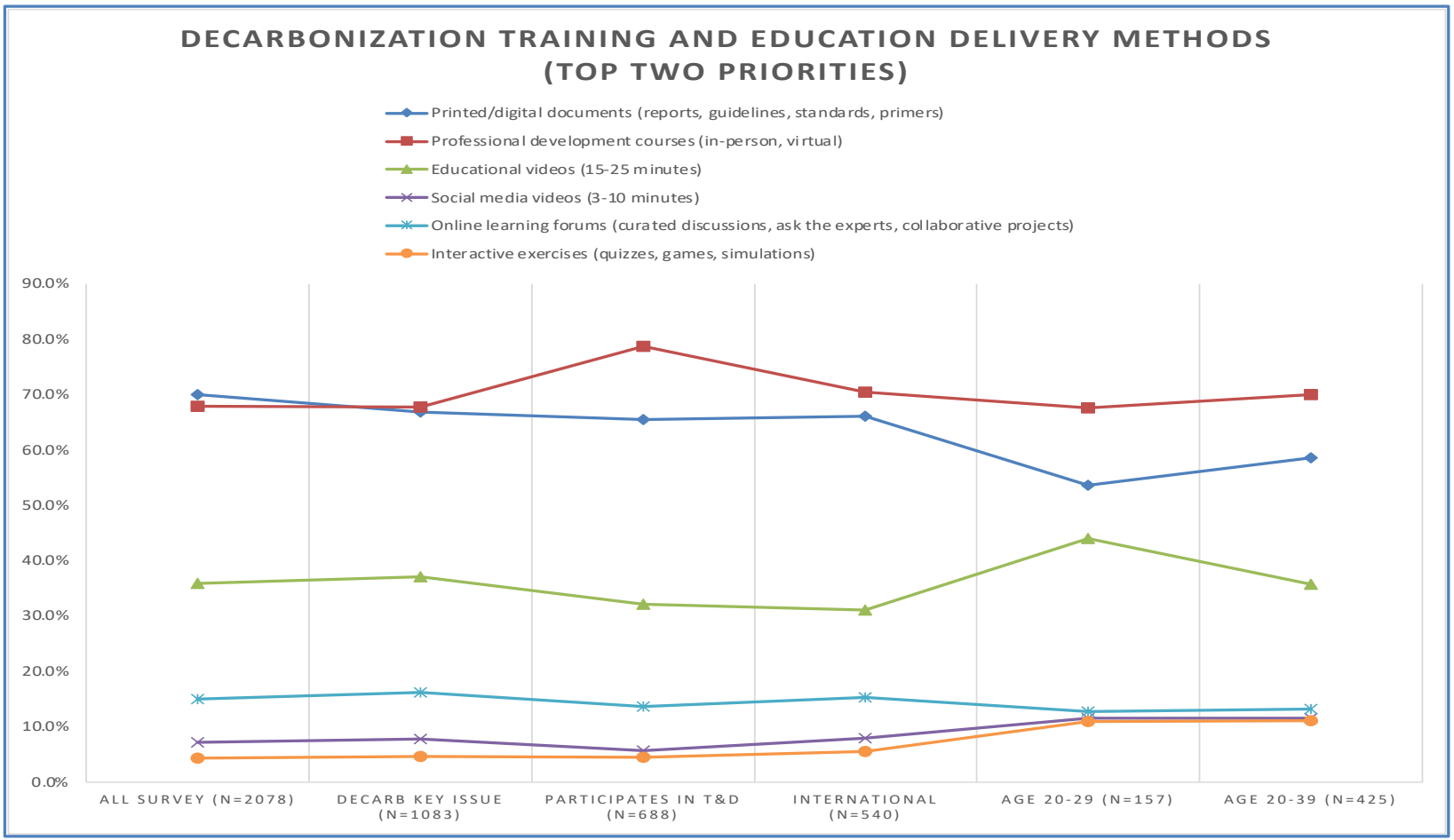
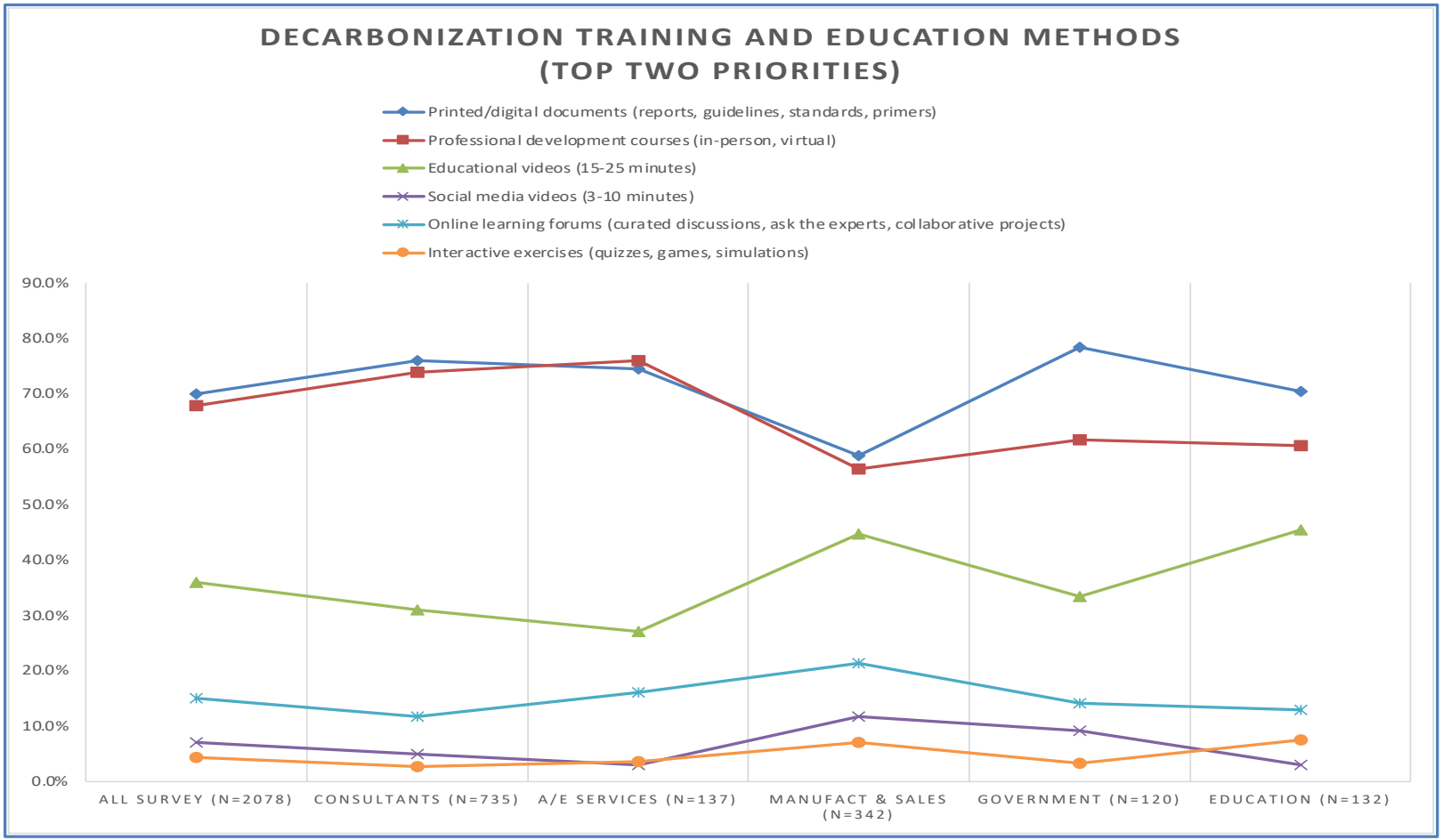
Decarbonization Training & Education Priorities



ASHRAE Member Satisfaction Survey
Decarbonization Training & Education Priorities



ASHRAE Member Satisfaction Survey
Write-in Comments on Building Decarbonization

- 2580 ASHRAE member responses to the survey
  - 2,078 responses to decarbonization training and education needs questions (80.6%)
  - 253 write-in comments
  - 47 comments were positive about ASHRAE's decarbonization focus and communications
  - 79 comments were negative about decarbonization (3.1% of respondents)
  - 50% of negative comments came from members over the age of 60 and 75% over the age of 50

Decarbonization Strategy Game
Training and Education Priority Results

Project Planning	Project Development	Construction & Renovation	Passive Efficiency	Active Efficiency	Facility Management	Distributed Energy Resources
1 Building Decarbonization Audit	6 Integrated Project Delivery	11 Building Material Reuse	16 Building Thermal Envelope	21 High Performance HVAC Equipment	26 Indoor Air Quality Management	31 On-site Renewable Energy
2 Policy and Regulation Review	7 Building Energy Modeling	12 Prefabrication & Modular Construction	17 Building Fenestration	22 Beneficial Electrification	27 Refrigerant Management	32 Energy Storage Systems
3 Financial Incentives Review	8 Life-Cycle Cost Analysis	13 Low Carbon Building Materials	18 Building Shading	23 Building Management and Control Systems	28 Integrated Facility Management	33 Managed Electric Vehicle Charging
4 Emission Reduction Roadmap	9 Building Life-Cycle Emissions Assessment	14 Low GWP Refrigerants	19 Building Surface Reflectivity	24 Lighting and Plug-load Management	29 Building Retro-commissioning	34 Demand Flexibility
5 Facility Capital Planning	10 Building Information Management	15 Construction Material Waste Reduction	20 Natural Ventilation and Thermal Management	25 Water Conservation	30 Building Education and Training	35 Off-site Renewable Energy

Highest Priority

Medium Priority

Note: Results from 100's of ASHRAE participants

CEBD & Tech Council Project Updates

Project: Flexible International Building Codes Framework

Summary: *Developing a flexible building code framework for emerging economies to streamline national/ subnational code building adoption, supporting tools, and training.*

Goals & Objectives

- Develop a flexible building codes framework and assessment tool for use in collaborative workshops with key national stakeholders in emerging economies.
- Support pilot country partners in developing recommendations for building code development, implementation, training, tools and supporting policies.

Key Partners

- ICC
- IEA
- UNEP
- World Bank
- ASHRAE international members

Why ASHRAE

- Aligns with ASHRAE's goal of supporting energy-efficient and sustainable building design, development and operations.

Decarbonization Impact

- Enables the integration of energy efficiency, low-carbon technologies, and GHG reduction strategies.
- Builds code development and compliance capabilities and helps define policy frameworks for low-carbon building design and development.

Project Champions:
Clay Nesler & Ghina Annan (CEBD)
Kashif Nawaz (Tech Council)

Project: Flexible International Building Codes Framework

Building Code Needs

Environmental	Infrastructure	Financial	Regulatory	Owners/Developers
1 Reduce building operational greenhouse gas emissions	6 Decrease water consumption and demand	11 Reduce building annual energy costs	16 Assure high levels of stakeholder engagement	21 Maintain building occupant comfort, health and safety
2 Reduce embodied carbon in building material and equipment	7 Protect and enhance natural systems and habitats	12 Increase build ng sector employment	17 Accurately predict the impact of implemented policies	22 Reduce building lifecycle costs
3 Reduce fossil fuel use in buildings for heating	8 Decrease transportation-related emissions	13 Assure cost effectiveness of building-related policies	18 Assure that policy impacts align with public commitments	23 Increase building asset value
4 Increase use of zero carbon renewable energy	9 Reduce waste from building construction and renovation	14 Reduce policy development and implementation costs	19 Assure high levels of compliance for implemented policies	24 Maintain compliance with government regulations
5 Increase facility resilience to climate change impacts	10 Decrease requirements for additional energy system capacity	15 Reduce policy training and compliance costs	20 Increase effectiveness of policy compliance design tools	25 Support sustainability goals and commitments

Decarbonization Measures

Project Planning	Project Development	Construction & Renovation	Passive Efficiency	Active Efficiency	Facility Management	Distributed Energy Resources
1 Building Decarbonization Planning	6 Integrated Project Delivery	11 Building Material Reuse	16 Building Thermal Envelope	21 High Efficiency HVAC Equipment	26 Building Retro-commissioning	31 On-site Renewable Energy
2 Building Safety and Resilience Planning	7 Building Energy Modeling	12 Low Carbon Building Materials	17 Building Fenestration	22 Heat Pump Hot Water and Space Heating	27 Indoor Air Quality Management	32 Energy Storage Systems
3 Natural Systems and Habitat Planning	8 Life-Cycle Cost Analysis	13 Indigenous Construction Materials and Methods	18 Building Shading	23 Heat Recovery and Thermal Storage	28 Low GWP Refrigerants	33 Managed Electric Vehicle Charging
4 Sustainable Transportation System Planning	9 Building Life-Cycle Emissions Analysis	14 Low Emission Construction Methods	19 Building Surface Reflectivity	24 Building Management and Control Systems	29 Refrigerant Management	34 Demand Flexibility
5 Energy and Water Infrastructure Systems Planning	10 Building Information Management	15 Construction Material Waste Reduction	20 Natural Ventilation and Thermal Management	25 Light-ig and Plug-load Management	30 Water Conservation	35 Off-site Renewable Energy

Code Design

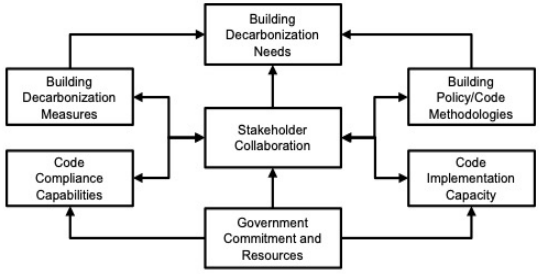
Code Types	Code Applicability	Code Metrics	Building Types	Construction Methods	Envelope Measures	HVAC Measures	Other Measures
Prescriptive	New Construction	Energy Use	Multi-family	Formal Design and Construction	Building Orientation and Fenestration	Space Cooling	Lighting Systems
Performance-based	Major Renovations	Energy Costs	Office/Retail	Standardized Design and Local Construction	Building Shading and Window Glazing	Space Heating	Building Controls
Outcome-based	Additions	Operational Carbon	Education	Vernacular Design and Construction	Air Leak Prevention	Water Heating	Energy Metering
Mandatory	Occupancy Change	Embodied Carbon	Healthcare	Informal Design and Construction	Insulation and Thermal Transmittance	Ventilation	On-site Renewable Energy
Voluntary	Existing Buildings	Whole Life Carbon Emissions	Government	Circular Building Construction	Solar Heat Gain	Dehumidification	Water Conservation

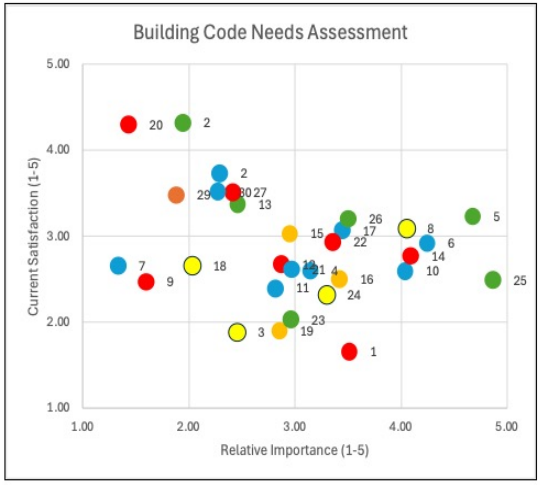
Code Development

Supporting Policies	Government Leadership	Government Incentives	Training and Education	Code Development Capabilities	Code Compliance Capabilities	Government Commitment
Building Energy Benchmarking	Demonstrations	Loans	Policymakers and Regulators	Policy Impact Analysis	Pre-construction Design Compliance (Permits)	National NDCs Climate Action Plans
Building Audits and (Retro) commissioning	Procurement	Grants	Architecture and Engineering Professionals	Policy Impact and Target Analysis	Post-construction Design Compliance (Occupancy)	State/Local Climate Action Plans
Building Performance Standards	Environmental Product Declarations	Rebates	Building Contractors	Policy Cost Effectiveness Analysis	Code Compliance Tools/Methods	Code Development Resources
Building Appliance Standards	R&D Investment	Tax Credits	Building Owners and Developers	Code Development Process Management	Code Official Training and Certification	Code Implementation Resources
Utility Programs and Rate Design	Workforce Development	Permitting and Code Allowances	Product and Service Providers	On-going Code Revision Process	Code Compliance Audit Process	Code Compliance resources

Decarbonization Stakeholders

National Government	State/Local Government	Design/Construction	Building Owners/Managers	System/Equipment Providers	Associations/Organizations	Other Stakeholders
Energy and Natural Resources	Energy and Environment	Architects	Corporate Real Estate	Building Cons and Shell Materials	Green Building Chapters	International Organizations
Housing and Urban Development	Building Regulations	Engineers	Commercial Real Estate	Envelope Systems and Materials	Buildings and Construction Industry Associations	Financial Institutions
Environmental Protection	Economic Development	Green Building Experts	Public Building Administration	MEP Systems and Equipment	Environmental NGOs	Municipal Utilities
Regulatory Compliance	Workforce Development	Contractors	Energy and Sustainability Managers	Interior Components and Systems	Real Estate Associations	Energy Utilities
Finance and Administration	Urban Planning	Real Estate Developers	Facility Managers and Building Operators	Appliance and Office Equipment Manufacturers	Community Organizations	University Researchers





Project Plan

- IEA project proposed – October 2024
- ASHRAE Indonesia engaged – November 2024
- ASHRAE Webinar (UK, Sudan, Ghana and Nigeria) - November 2024
- Draft codes framework – January to March 2025
- Framework review and revision - April to June 2025
- Pilot country workshop - July to September 2025
- Flexible international building codes framework facilitator's guide and sample report – October to November 2025

Project Champions:
Clay Nesler & Ghina Annan (CEBD)
Kashif Nawaz (Tech Council)

Project: Update HVAC Equipment Service Life Data

Summary: *This project aims to update ASHRAE equipment service life data, which has not been revised since 1978 and 2005. Understanding the lifespan of HVAC equipment is essential for evaluating building decarbonization strategies, conducting lifecycle assessments, and planning capital replacements.*

Goals & Objectives

- Consolidate an updated HVAC equipment service life database to replace outdated data in ASHRAE Handbook, Chapter 38.
- Determine lifespan expectations for HVAC components used in modern building systems.
- Develop procedures for gathering accurate data from building owners and manufacturers.
- Improve decarbonization planning by integrating new equipment longevity insights.

Key Partners

- ASHRAE Technical Committee TC 7.3
- Air-Conditioning, Heating, and Refrigeration Institute (AHRI)
- Building Owners & Equipment Manufacturers
- CEBD Special Projects Committee

Why ASHRAE

- ASHRAE sets the global standard for equipment service life estimations.
- Lifecycle planning & decarbonization strategies depend on accurate HVAC lifespan data.
- Collaboration with manufacturers & researchers ensures data validity for modern systems.

Decarbonization Impact

- Supports carbon footprint reduction by optimizing HVAC replacements and maintenance schedules.
- Helps engineers & planners make energy-efficient decisions based on realistic equipment longevity.
- Contributes to better lifecycle emissions assessments for building.

Project Champions:
Blake Ellis & Kent Peterson (CEBD)
Mark Fly (Tech Council)

Project: CEBD Whole - Life Carbon Gap Analysis

Summary: *This project aims to analyze gaps in whole-life carbon accounting methodologies, datasets, and tools. By understanding current industry challenges, the study will identify missing elements and recommend improvements to support better decision-making in building decarbonization strategies.*

Goals & Objectives

- Review and assess existing whole-life carbon assessment frameworks.
- Identify critical gaps in datasets, tools, and methodologies.
- Engage with industry stakeholders to align best practices for whole-life carbon tracking.
- identify how ASHRAE expertise is best suited to help close gaps directly or to help facilitate work in this area with a long-term goal of robust WLC analyses.

Key Partners

- ASHRAE CEBD
- Global Carbon Accounting Organizations
- Life Cycle Assessment (LCA) Experts
- Building Performance Evaluation Associations

Why ASHRAE

- ASHRAE is leading efforts in building decarbonization and sustainability assessments.
- This project aligns with ASHRAE's Position Document on Building Decarbonization goals.

Decarbonization Impact

- Improves accuracy of carbon tracking across the building lifecycle.
- Enhances data-driven decision-making for building sustainability.
- Encourages policy alignment with global decarbonization targets.

Project Champions:
Carrie Brown and Ghina Annan (CEBD)
Lisa Ng (Tech Council)

Project: Whole Life Carbon Calculation Guide for Building Systems

Summary: *This project focuses on the whole life carbon impact of Mechanical, Electrical, and Plumbing (MEP) systems, which can contribute up to 50% of a building's total embodied carbon footprint. The goal is to develop a standardized methodology to calculate, report, and reduce carbon emissions associated with MEP systems throughout their lifecycle.*

Goals & Objectives

- Develop a comprehensive framework for calculating whole life carbon of MEP systems, covering design, procurement, operation, and end-of-life phases.
- Establish standard benchmarks and best practices for tracking MEP system carbon emissions.
- Create protocols for collecting & validating embodied carbon data from Environmental Product Declarations (EPDs), supplier reports, and industry sources.

Key Partners

- ASHRAE CEBD
- RICS
- ICC/ASHRAE 240P Standard
- MEP Industry Suppliers & Consultants
- Canada NRC (National Research Council) for Pilot Study Collaboration

Why ASHRAE

- ASHRAE leads building decarbonization globally, making it the ideal organization to standardize MEP carbon calculations.
- Existing ASHRAE documents emphasize MEP emissions tracking.
- Aligns with ASHRAE's climate action targets for reducing embodied carbon in buildings.

Decarbonization Impact

- Supports carbon neutrality by 2050 by establishing clear reduction targets for MEP systems.
- Helps engineers, architects, and policymakers make informed decisions about low-carbon materials & equipment.
- Encourages the adoption of best practices for emissions reduction across the building lifecycle.

Project Champions:
Ghina Annan & Luke Leung (CEBD)
Corey Metzger (Tech Council)

Project: Whole Building MEP Benchmarking Data Research

Summary: *This project focuses on benchmarking the whole life carbon impact of Mechanical, Electrical, and Plumbing (MEP) systems across various commercial building typologies (e.g., offices, schools, hospitals, warehouses, retail). The goal is to develop a standardized methodology for assessing, reporting, and reducing MEP-related carbon emissions, supporting industry-wide decarbonization strategies.*

Goals & Objectives

- Develop a standardized benchmarking framework for whole life carbon assessment of MEP systems.
- Collect & validate embodied carbon data from (EPDs), supplier reports, and manufacturers.
- Assess operational carbon contributions of MEP systems over their lifespan.
- Establish performance benchmarks for different building types.

Key Partners

- ASHRAE CEBD
- RICS
- MEP2040 Initiative
- Carbon Leadership Forum
- CIBSE

Why ASHRAE

- ASHRAE is the leading organization in HVAC and building systems sustainability.
- Aligns with ASHRAE's Building Decarbonization goals for 2030 and 2050.
- Provides a science-based approach to benchmarking MEP system emissions for global adoption.

Decarbonization Impact

- Supports the MEP2040 commitment for reducing MEP system carbon emissions.
- Provides clear carbon reduction targets for different MEP components.
- Helps engineers, designers, and building owners optimize MEP system selection for sustainability.

Project Champions:
Ghina Annan, Luke Leung, Kayleigh Houde (CEBD)

Project: Residential Retrofits – A Summary of Existing Resources

Summary: *Residential retrofits are a critical component of achieving decarbonization goals. This project aims to compile well-referenced resources on residential decarbonization retrofits, making them easily accessible for ASHRAE members. The focus is on energy efficiency, electrification, and resilience in residential buildings.*

Goals & Objectives

- Compile well-vetted resources on residential decarbonization retrofits
- Ensure ASHRAE members have easy access to information on residential retrofit strategies.

.

Key Partners

- Residential Buildings Committee
- 90.2

Why ASHRAE

- Residential retrofits will play a critical role in meeting decarbonization goals.
- The project aligns with ASHRAE's commitment to net-zero buildings by 2050.

Decarbonization Impact

- Supports GHG emissions reduction by improving retrofit adoption & awareness.
- Helps local policymakers & engineers promote net-zero residential construction.
- Provides clear guidelines for integrating electrification, energy efficiency, and resilience into homes.

Project Champions:
Carrie Brown and Clay Nesler (CEBD)
Devin Abellon (Tech Council)

Project: Decarbonization Strategies for Supermarket Industry Archetypes

Summary: *Supermarkets operate 24/7 and require air conditioning, heating, refrigeration, lighting, and ventilation, making them high-energy consumers. This project aims to develop decarbonization strategies tailored for supermarkets by integrating design, operations, and sustainability principles to reduce energy use and emissions while maintaining food safety and customer comfort.*

Goals & Objectives

- Form a working group with industry experts, ASHRAE members, and stakeholders.
- Identify decarbonization strategies specific to supermarkets, including HVAC, refrigeration, lighting, and operations.
- Assess existing ASHRAE guidelines and determine their applicability to supermarkets.
- Develop a supermarket-focused decarbonization design guide using ASHRAE's standards.

Key Partners

- ASHRAE TCs & CEBD Supermarket Industry Stakeholders (designers, facility managers, operations teams)
- US DOE & EPA
- AEDG for Grocery Stores & Sustainability Experts

Why ASHRAE

- This project aligns with ASHRAE's mission to support low-carbon, energy-efficient commercial spaces.

Decarbonization Impact

- Reduces HVAC and refrigeration-related emissions, which are significant contributors to supermarket carbon footprints.
- Supports corporate sustainability goals (e.g., zero-carbon roadmaps from major retailers like Walmart and Kroger).
- Helps supermarkets meet Scope 1, 2, and 3 carbon reduction targets.

Project Champions:

Rajan Rajendran (CEBD)

Bruce Nelson (Tech Council)

Project: Refrigerant Emissions Management, Tracking and Compliance

Summary: *This project focuses on collecting more current refrigerant leakage data for North American installed HVACR equipment to serve two main uses: 1) provide a current, consistent, peer-reviewed data set, agnostic of manufacturer-specific data, for ASHRAE standards to reference as part of their whole-life carbon calculations for annual leakage rate assumptions, and 2) Provide current data on most common leakage points for equipment to help direct future R&D around design, installation, or maintenance changes which could reduce future refrigerant leakage rates.*

Goals & Objectives

- Establish a short "Missing Data" Research project to verify and identify holes in existing data sets
- Create a voluntary anonymized collection of historical leakage data
- Rank reported leakage source occurrences from highest to lowest for each type of equipment

Key Partners

- CBRE, JLL, Large Portfolio Operators
- Better Buildings Design and Construction Allies
- AHRI
- ASHRAE TCs & CEBD

Why ASHRAE

- The project aligns with ASHRAE's commitment to net-zero buildings by 2050.
- ASHRAE members have Global insights into regulatory requirements

Decarbonization Impact

- Reported refrigerant leakage rates range from less than 1% annual leakage to as much as 25% annual leakage depending on equipment type, age, with several references suggesting a range of 7-12%. With GWP of refrigeratns also have a huge range, the data tracking project will help idenitfy longtitudinal impacts of refrigerant leakage.

Project Champions:
Stet Sanborn (CEBD)
Bruce Nelson (Tech Council)

Project: Decarbonization Framework for Generative AI Data Centers

Summary: *Generative AI data centers require substantial computational power and cooling systems to maintain operating temperatures in data centers, contributing massive load growth to power grid, especially as the demand for AI models and services grows. This project aims to develop decarbonization framework tailored for AI-driven data centers by integrating proper power management, energy efficiency and energy storage, renewable energy and waste heat utilization. By combining these strategies, generative AI data centers can significantly reduce their carbon footprint while maintaining high performance and reliability.*

Goals & Objectives

- To create a decarbonization framework for AI-driven data centers that combines sustainable power management, energy efficiency, renewable energy, and waste heat utilization, reducing environmental impact while supporting the growth of generative AI.

Key Partners

- ASHRAE
- Cooling & energy storage firms
- Regulators & policy makers
- AI hardware manufacturers
- Operators and cloud providers

Why ASHRAE

- Standards and Guidelines (Standard 90.4)
- Reseach and innovation (TC 9.9)
- Training and certification programs

Decarbonization Impact

- Reduction in carbon footprint
- Improved grid stability
- Resource efficiency with reduced electricity and water consumption
- Economic benefits with reduced energy costs and utility bills

Project Champions:
Bing Liu & Blake Ellis (CEBD)
Devin Abellon (Tech Council)

White House A3 Refrigerant Update

Stet Sanborn

A3 Refrigerant Roadmap Industry Collaboration

Summary: *This project focuses taking the lessons learned from the A2L transition to develop a streamlined roadmap for completing an indepth risk assessment, safety testing, and efficiency testing for A3 refrigerants.. The collaboration has included the former Whitehouse Climate Office, Department of Energy, US EPA, CAARB, representation from fire-marshals, non-profit advocacy groups, UL, and OEM manufacturers*

Goals & Objectives

- Develop Robust A3 Risk Assessment
- Conduct Required Safety Testing
- Conduct Required Efficiency Testing
- Inform updates to Codes and Standards

Key Partners

- OEM's
- Fire Marshalls
- UL
- ASHRAE STD 34/15/15.2 Members
- National Labs
- CEBD

Why ASHRAE

- The project aligns with ASHRAE's commitment to net-zero buildings by 2050.
- ASHRAE members have Global insights into regulatory requirements

Decarbonization Impact

- Many A3 Refrigerants offer ultra-low GWP and very high efficiency. However, they do involve higher flamability risks. European regulatory requirements have pushed A3 refrigerants to the forefront.

CEBD Champions:
Stet Sanborn

MEP 2040 Update

Kayleigh Houde

MEP 2040

The Beginner's Guide to MEP Embodied Carbon

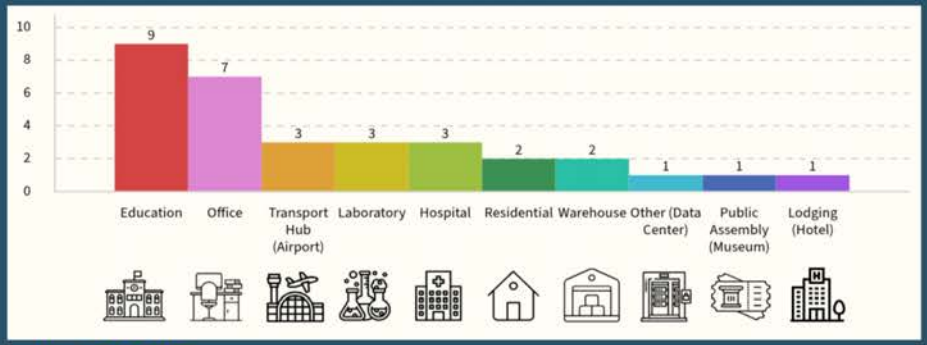
Planned Release Date:
April 22, 2025

MEP Whole Life Carbon Pilot

32

Pilot Projects

Launched: February 5, 2025



MEP 2040 + architecture 2030

MEP 2040 now operates under the fiscal sponsorship of Architecture 2030

ASHRAE CEBD

Strategic Project Alignment:

- Refrigerant Emissions Tracking
- Update HVAC Equipment Service Life
- MEP Benchmarking Data Research

ECHO Project

ECHO v1 Reporting Schema
September 2024

AHRI Decarbonization Update

Jaime Yeh

AHRI Activities

- AHRI PCR & EPD Task Force is finalizing plan for AHRI to be Program Operator for PCRs & EPDs
  - Current Activity:
    - Gap assessment of existing industry resources – PCRs, LCAs, EPDs
    - Identifying product category groupings and prioritization
  - Target Milestones
    - Y1: Finalize program structure and procedures, product categorization and prioritization; draft and publish General Program Instructions; Begin PCR development
    - Y2: Publish Part A PCR + Part B PCRs for top priority product categories; develop and publish industry average EPDs as needed.
- Decarbonization Standards Technical Committee – proposed Guideline for Scope 3 Category 11 emissions calculations. Initial products to be included: residential & commercial AC/HP, furnaces

AHRI
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Budget Update

Kent Peterson

2022-2025 TFBD Budget Update

As of: January 31, 2025

Item	Budget	Spent	Notes
Guide Development	$719,000	$410,049	
Standards	$322,500	$33,800	
Training & Education	$303,377	$148,238	
Website & Marketing	$178,000	$15,870	
Contingency	$303,635	$0	
Totals	**$1,827,812**	**$607,957**	

$1,122,355 savings to date

CEBD Budget Request

Blake Ellis

Feb 2025-June 30, 2026 CEBD Budget Update

Item	Budget	Notes
CEBD Led Activities	$70,000	Projects
Tech Council Led Activities	$950,000	Projects & Decarb Standards Development
PubEd Council Led Activities	$110,000	Training & Education, Publications, Certification
Administrative	$55,000	Travel
Contingency	$226,000	
Totals	**$1,411,000**	

$288,645 additional funds requested

Closing Comments

Kent Peterson


Thanks to our volunteers and staff!

Comments to CEBD

Open Session