



International Energy Conservation Code E4C-HVACR Subcommittee

Meeting Notes

February 24, 2022

11:00 AM EST to 2:00 PM EST (Note the change to 3 hours)

[Webex](#) Link

Notes are in blue

Committee Chair: Shaunna Mozingo, Mozingo Code Group LLC

Committee Vice Chair: Blake Shelide, Oregon Department of Energy

1. **Call to order**-Chair. [Called to order at 11:03 EST.](#)

2. **Meeting Conduct.** Staff

a. [Identification of Representation/Conflict of Interest](#)

b. ICC [Council Policy 7](#) Committees: Section 5.1.10 Representation of Interests

c. ICC [Code of Ethics](#): ICC advocates commitment to a standard of professional behavior that exemplifies the highest ideals and principles of ethical conduct which include integrity, honesty, and fairness. As part of this commitment, it is expected that participants shall act with courtesy, competence, and respect for others.

3. **Roll Call** – Establish Quorum- Vice-Chair [Quorum was established with 14 voting members, and more arrived as the meeting progressed.](#)

	First Name	Last Name	Category	Company
<input checked="" type="checkbox"/>	Christopher	Arnold	Consumer	Grand forks Public Schools
<input checked="" type="checkbox"/>	John	Bade	Utility	2050 Partners
<input checked="" type="checkbox"/>	Ellen	Eggerton	Gov. Regulator	City of Alexandria
<input checked="" type="checkbox"/>	Drake	Erbe	Standards Promulgator	ASHRAE
<input checked="" type="checkbox"/>	Henry	Ernst	Manufacturer	Daiken
<input checked="" type="checkbox"/>	Mark	Heizer	Gov. Regulator	Oregon Bldg Codes Div
<input type="checkbox"/>	Adrian	Jones	Gov. Regulator	City of Lawrence
<input checked="" type="checkbox"/>	Gary	Klein	User	Self
<input checked="" type="checkbox"/>	Jeff	Kleiss	Manufacturer	Lochinvar (AO Smith)
<input checked="" type="checkbox"/>	Benjamin	Levie	Consumer	UCSF
<input checked="" type="checkbox"/>	Dick	Lord	Manufacturer	Carrier
<input checked="" type="checkbox"/>	Frank	Morrison	Manufacturer	Baltimore Aircoil
<input checked="" type="checkbox"/>	Shaunna	Mozingo	User	Mozingo Code Group
<input checked="" type="checkbox"/>	Christopher	Perry	Gov. Regulator	US DOE
<input checked="" type="checkbox"/>	Daniel	Nall	Gov. Regulator	Dan Nall Consultant/ AIA
<input checked="" type="checkbox"/>	Laura	Petrillo-Groh	Manufacturer	AHRI
<input checked="" type="checkbox"/>	Kevin	Rose	Public Segment	NEEA
<input checked="" type="checkbox"/>	Thomas	Schultz	Utility	Spire and American Gas Assoc.
<input checked="" type="checkbox"/>	Blake	Shelide	Gov. Regulator	Oregon Dept of Energy
<input checked="" type="checkbox"/>	Amin	Tohmaz	Gov. Regulator	City of San Antonio

<input checked="" type="checkbox"/>	Doug	Tucker	Manufacturer	Mitsubishi
<input checked="" type="checkbox"/>	Jeremy	Williams	Gov. Regulator	US DOE
<input type="checkbox"/>	James	Yeoman	Gov. Regulator	City of Orem

4. **Approval of Minutes** Approval of February 10th meeting minutes [Moved by John Bade, Seconded by Frank Morrison, passed unanimous voice vote.](#)

5. **Approval of Agenda** [Moved by John Bade, Seconded by Henry Ernst.](#)

- [Suggested modifying by removing CEPI-9 and CEPI-97 because the proponent cannot be here until next week. Supported by co-proponent Kevin Rose. The motioners agreed. Approved by unanimous voice vote.](#)

6. Old Business

- Items forwarded to other committees for review or completion.
- held back from E4C- proposal CEPI-014 that was A/M on Feb 10 until we hear CEPI-088. [Envelope will hear CEPI-64 and 65 on March 3, so these will be on the agenda for the next meeting.](#)
 - [The chair noted that CEPI-14 was approved as modified at the last meeting, but she held it since it is related to CEPI-98, the first item on the agenda today.](#)

7. **Action Items.** [\(We will hear as many of these as possible. Any proposal not heard in this meeting will be moved to the next meeting's agenda\)](#)

a. CEPI-098, Dedicated Outdoor Air Systems, Mark Lyles

- [Presented by the proponent, Mark Lyles](#)
 - [Said that is similar to the Washington State Code](#)
 - [Occupancy classes are spaces where DOAS makes sense](#)
 - [Pointed out the exception where users can use other equipment if it is 10% more efficient than the minimum.](#)
 - [Heating and cooling systems must shut off when there is no call for heating or cooling because space temperature is in the deadband.](#)
 - [Exhaust air energy recovery is required in all cases.](#)
 - [The proposal removes DOAS from C406 since it would no longer be optional.](#)
- [Ellen Eggerton is against requiring that fans shut off when temperatures are in the deadband. She stated that air circulation is needed in places with high humidity, even when in the deadband. She suggested adding "except where moisture control is required" to the fan shutoff in the deadband requirement.](#)
 - [She also said that control with CO₂ must be considered.](#)
- [Thomas Schultz](#)
 - [These systems are good, but the proposal limits the designer's creativity too much.](#)
 - [Said there are a lot of good examples of the use of DOAS.](#)
 - [Does not like requiring ventilation air to be delivered downstream of the terminal unit. He would create problems with comfort. It may require the installation of a completely separate ventilation system.](#)
- [Henry "Skip" Ernst \(Daikin\)](#)
 - [Thinks the claim that energy is always saved can be challenged.](#)
 - [He says this needs a lot more discussion.](#)
- [Laura Petrillo-Groh \(AHRI\)](#)
 - [Agrees that it needs a lot more discussion.](#)
 - [Believes the studies have technical flaws, Cited the single-speed fan requirement, which does not take fan power staging into account](#)
 - [She is concerned about the outside air w/cfm requirement.](#)
- [Amanda Hickman \(on behalf of AMCA\)](#)

- Pointed out that Washington State's climate is well-suited to DOAS but this does not necessarily apply to all climate zones and is not suitable for a national code.
- Mark Heizer (Oregon Building Codes Division)
 - The proposal is too limiting
 - Not allowing the central fan systems to operate in the deadband is a problem.
- Eli Howard (SMACNA)
 - Supports the comments from AHRI and AMCA
 - Concerned that the proposal may not meet the ventilation code
 - He thinks some of the exceptions do not make sense.
 - Not sure that the modeling represents real-world results.
 - Not applicable for a national code
- Gus Faris (Nailor)
 - Pointed out that Washington allows fan-powered terminals if they can vary airflow, and this proposal does not.
 - Suggested separating the ventilation and conditioning airstreams prevents mixing of the airstreams, resulting in some parts of the space receiving little ventilation air.
 - A one-size-fits-all rule takes away the creativity of design engineers to solve problems.
- Aaron Gunzner (AMCA) supports the statements against the proposal.
- John Bade (California Investor Owned Utilities)
 - Said models should compare DOAS with exhaust air energy recovery to conventional systems with exhaust air energy recovery.
- Dan Nall
 - Said that there are places where separating the airstreams is very beneficial, but does not support a one-size-fits-all requirement.
- Rebuttal from Mark Lyles
 - States are following Washington State, and this needs to be in a model code.
- **Mark Heizer moved to disapprove, Seconded by Thomas Schultz.** Reason: the proposal is too encompassing for too many climate zones and "limiting of system types." **The motion passed 14-0-4.**

b. CEPI-111, Parking Garage Ventilation, Emily Toto (returned from E4C)

- Sent back from the E4C
- Ellen Eggerton suggested changing solid walls to full-height solid walls.
- Daniel Nall suggested calling out a maximum air velocity through the openings.
- John Bade suggested dropping the definition and requirement 1, then leaving it to the IMC and engineers to decide when the ventilation systems should be separated.
- Jeff Kleiss suggested adding a carbon monoxide alarm requirement.
- Mike Kennedy said he is open to either deleting the definition or adding full-height walls. He suggested stating that a car cannot be able to drive from one section to another could be a good way to define a separate parking garage section.
- Mark Heizer said that the IMC should do this. The chair pointed out that the IMC-2024 is done and cannot be changed until 2027. However, she agrees with leaving the decision to the designers. She would like comments from engineers and experts on the contaminant levels.
- Ellen Eggerton wants to make sure that all spaces get adequate airflow. Suggests adding alarms and requiring that they are in all sections of the garage.
- Mike Kennedy suggests that keeping the definition of the separate section could lead to simpler, more reliable systems. He reported some limits on contaminants

from existing safety regulators. For example, the NIOSH limit on CO for 15 minutes is 200 ppm.

- John Bade said that the committee is going beyond its area of competence.
 - The chair does not support the proposal for the same reasons as John Bade.
 - Drake Erbe moved for disapproval of the entire proposal, Seconded by Dan Nall. Failed 7-7-1
 - Mike Kennedy suggested that the updates to the exceptions be kept.
 - Jon McHugh suggested a second vote to keep the energy savings parts.
 - Blake Shelide said that we need to vote on the modifications first.
 - Ellen Eggerton moved to address the parking garage definition by adding “full-height walls.” Seconded by Thomas Schultz. Failed 2-12-1
 - Kevin Rose suggested that a small working group address this.
 - **Mark Heizer moved to table the proposal to fix the submitted version and bring it back on March 24th. Seconded by John Bade. Passed 15-0-0**
 - Working Group: Mark Heizer, John Bade, Drake Erbe, Emil Toto
- c. CEPI-109 and -110, Demand Control Ventilation, Jeremy Williams/Mike Kennedy
(combined to create one proposal by proponents)
- Mike Kennedy said that his portion of the proposed changes are for added clarity
 - Mike Tillou (PNNL) – Improved the exceptions for energy recovery
 - Ellen Eggerton supporting 110 as further modified, Seconded by Kevin Rose NEEA. Passed 13-03
 - John Bade said that the phrase “in accordance with” will allow designers to add exhaust air energy recovery where it is not beneficial to avoid demand control ventilation.
 - Jon McHugh agreed with John Bade
 - John Bade moved change “in accordance with” to “where required by” Seconded by Gary Klein. Failed 4-11-1.
 - Mike Kennedy suggested modifying exception 3 to add “system” in front of “design outdoor airflow.”
 - Kevin Rose moved to modify exception 3 to add system in front of “design outdoor airflow, Seconded by Mark Heizer, passed 13-1-2.
 - **Ellen Eggerton moved to support CEPI-110 as further modified, Seconded by Kevin Rose of NEEA. Passed 13-0-3.**
 - **John Bade moved to disapprove CEPI-109 because included in CEPI-110, Seconded by Gary Klein. Passed by unanimous vote.**
- d. CEPI-86, Fault Detection &Diagnostics, Bill Fay
- Amy Boyce of the EECC spoke for the proponent.
 - Said that it will improve clarity and enforceability.
 - John Bade agreed.
 - Bryan Holland from NEMA supports the revisions.
 - **John Bade moved to approve as submitted, Chris Perry seconded. Reason statement: These are good clarifications that will improve enforcement. The motion passed 12-0-1.**
- e. CEPI-73, Flexible Facilities, Megan Hayes
- Bryan Holland from NEMA spoke as the proponent. He stands on the reason statement.
 - Said the 100,000 ft² threshold is tied to the Fault Detection and Diagnosis requirements, and the requirement in C405.12 requires an energy monitoring system.
 - John Bade spoke against the proposal. He likes the idea, but said it belongs in the IMC. In addition, it not provide enforceable requirements. For example, there is a requirement for the building systems to react when indoor contaminants

exceed an undefined value, but neither the pollutants nor the threshold values are defined.

- Ben Levie (UCSF) agreed.
- **John Bade moved to disapprove, Seconded by Frank Morrison. Reason: this proposal should be presented the IMC with enforceable requirements. Passed 12-2-0** no votes: Dan Nall, Thomas Schultz

f. CEPI-97, Boiler Controls, Nicholas O’Neil

- Removed until the next meeting during the agenda approval

g. CEPI-099, Grid Integrated Thermostats, Kimberly Cheslak

- Mark Lyles spoke as the proponent.
 - The original proponent had emailed the chair asking to add the clarification “for space conditioning systems.”
- Bryan Holland (NEMA) spoke in favor.
- Chris Perry (DOE) spoke in favor. He said it should be in the main body of the code and not in an appendix.
- Skip Ernst noted that Title 24 has requirements the communication is protocols, and thinks the lack of requirements in this proposal will cause confusion for users and code officials..
- Mark Heizer would support the proposal as an appendix for local adoption. He does not think that any community co-ops in his state could support this since they cannot communicate with thermostats in buildings. He would be in favor of local adoption where a utility does have that capability.
- Dan Nall spoke in favor. Said that being able to respond to the carbon coefficient of the grid is very important.
- Laura Petrillo-Groh (AHRI) said that important parts of that are needed requirements are not included, and in particular, communication protocols need to be added. She suggested that using the proposed time-of-use rates in the Cost-effectiveness committee should be considered. Overall, the proposal is too broad.
- Bryan Ahee (Bradford White Corporation) said the definition is not based on industry consensus. He noted that the same definition was proposed for ASHRAE 189.1 and was modified.
- Blake Shelide (Oregon DOE) was generally supportive but concerned about item 5 because the requirements for peak demand control are not clear.
- Mike Kennedy suggested a work group be created to improve the proposal
 - Skip Ernst agreed that the proposal has not been vetted enough.
- Dan Nall moved for approval as modified, seconded by Chris Perry. Reason: The proposal is very important so that buildings can respond to grid needs. Failed 4-10-1.
- Shaunna Mazingo noted the word capable is not used in the rest of the code.
 - Mark Heizer noted that many utilities will likely never have the capability to do this so “capable” is needed.
- Laura Petrillo-Groh moved for disapprove to allow it to be reworked. Seconded by Frank Morrison. Failed 5-9-1
 - Discussion of the motion:
 - Tom Schulz would like to see this in an appendix where it can be approved in jurisdictions where the utilities can do this.
 - Dan Nall said that we should require it so that buildings are ready when the utilities can provide the service.
 - John Bade suggested pulling back and reworking.
 - Laura Petrillo-Groh noted the without communication protocol creates a risk of stranding grid-enabled equipment if they cannot communicate with the utility.

- **The chair moved to table the motion until March 24, seconded by Thomas Schultz. Passed 13-0-1 Mark Heizer abstained.**
 - Working Group: John Bade, Gary Klein, Laura Petrillo-Groh, Frank Morrison, Skip Ernst, Ben Levie, Jon McHugh.
- h. CEPI-108, Ventilation Occupied Standby Controls, Jonathan McHugh
- Jon McHugh spoke for the proposal in place of the proponent.
 - The proposal would add occupied standby controls to IECC
 - It uses the same occupancy controls already required for lighting.
 - Drake Erbe spoke in favor of the proposal.
 - **Drake Erbe moved to accept the proposal, seconded by John Bade. Reason: This is a compilation of two ASHRAE documents with clarification. Passed 15-0-0**
- i. CEPI-101, Occupied Standby Controls, Emily Toto
- **Motion to disapprove by John Bade, Drake Erbe seconded. CEPI-101 is no longer needed because of the approval of CEPI-108. Passed 15-0-1. Abstention by Gary Klein.**

The following proposals will be discussed during the March 10, 2022 meeting:

- j. CEPI-105, DX Condenser Fan Control, Glory O'Brien
- k. CEPI-107, Direct Digital Control Airflow Rates, Emily Toto
- l. CEPI-009, Kitchen Exhaust, Nicholas O'Neil
- m. CEPI-112, Energy Recovery, Series, Emily Toto
- n. CEPI-113, ERV Nontransient Dwelling Units, Mike Moore
- o. CEPI-114, Energy Recovery, Exception 8, Glory O'Brien
- p. CEPI-117, ERV other spaces, Glory O'Brien

9. Other business.

- a. Discuss order for hearing proposals for next meeting
- b. Identify and schedule discussion dates for proposals that were sent to us from other subcommittees, if applicable.

11. Upcoming meetings.

- a. Second and fourth Thursday of each month, 11:00 am – 2:00 pm Eastern Time
Next meeting is March 10, 2022.

12. Adjourn. Moved by Blake Shelide, seconded by Kevin Rose.

FOR FURTHER INFORMATION BE SURE TO VISIT THE ICC WEBSITE:

[ICC Energy webpage](#)

[Code Change Monograph](#)

FOR ADDITIONAL INFORMATION, PLEASE CONTACT Blake Shelide, Subcommittee Vice-Chair at blake.shelide@energy.oregon.gov