



# International Energy Conservation Code E4C-HVACR Subcommittee

## Meeting Notes

Notes are in [blue](#)

March 10, 2022  
11:00 AM EST to 2:00 PM EST

**Committee Vice Chair:** Blake Shelide, Oregon Department of Energy

Summary of proposal action votes at this meeting:

- CEPI-97, Boiler Controls, Nicholas O'Neil. Approved as modified 12-1-4.
- CEPI-105, DX Condenser Fan Control, Glory O'Brien. Disapproved 14-0-1.
- CEPI-107, Direct Digital Control Airflow Rates, Emily Toto. Approved 16-0-0.
- CEPI-009, Kitchen Exhaust, Nicholas O'Neil. Approved as modified 14-0-1.
- CEPI-112, Energy Recovery, Series, Emily Toto. Approved 13-0-1.
- CEPI-113, ERV Nontransient Dwelling Units, Mike Moore. Approved as modified 13-0-1.
- CEPI-114, Energy Recovery, Exception 8, Glory O'Brien. Tabled until April 10.15-0-0.
- CEPI-76, HVAC Total System Performance, Jeremy Williams. Approved as modified. 9-5-1.

1. **Call to order**-Chair. [Called to order by Blake Shelide at 11:02 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- John Bade. Quorum was established with 14 voting member present at the start of the meeting.

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

#### 4. Approval of Minutes Approval of February 24, 2022 Minutes.

- Moved as modified by Ellen Eggerton, seconded by Jim Yoeman. Passed by unanimous voice vote.

#### 5. Approval of Agenda

- Moved out CEPI-111 since it was tabled until March 24.
- Motion by Mark Heizer, seconded by Chris Perry. Passed by unanimous voice vote.

#### 6. Old Business

- a. Items forwarded to other committees for review or completion. John Bade (California Investor Owned Utilities) reported that CEPI-64 was reviewed by the Envelope and Embodied Carbon Subcommittee and that only editorial changes were suggested.

#### 7. Action Items.

- a. CEPI-111, Parking Garage Ventilation, Emily Toto (returned from E4C, tabled from 2/24 to fix definition) **Removed to next meeting.**
- b. CEPI-97, Boiler Controls, Nicholas O'Neil
  - Nicholas O'Neil (Northwest Energy Efficiency Alliance (NEEA)) spoke for the proposal.
    - Modified from the original after discussion with individual committee members.
    - Based on requirements in Title 24.
    - Changed requirement from “driven by variable speed drive” to “motor shall be variable speed.”
    - Added “these concentration limits do not apply” to the exception.
    - Mark Heizer (Oregon Bldg Codes Div) Noted that process boilers are something new in the code, and may be difficult to enforce.
    - Concerned that adding process loads is out of scope of Section 403
  - Laura Petrillo-Groh (AHRI)
    - Concerned that this requirement might be preempted because of the variable speed motor design requirement and the operational controls.
      - Chris Perry said that DOE is not concerned about the operational requirements, but the variable speed fan might be an issue.
      - John Bade suggested discussing the proposal in the ASHRAE SSPC 90.1 Mechanical Subcommittee to be held later today.
  - Gary Klein (California Investor Owned Utilities) said that we need to make sure that the term process boilers should not be used.
    - A review of the text showed that the term has been removed from the text.
  - Thomas Schultz (Spire & American Gas Association (AGA)) noted a concern that the preemption issue could be a problem with the full committee.
  - Ben Levie (USCF)
    - Concerned that calling out the oxygen level is too prescriptive.
    - Noted that the type of fuel used could change the required level of oxygen.

- Motion to accept the proposed changes moved by John Bade, seconded by Kevin Rose. 12-1-3.
    - No: Laura Petrillo-Groh. Abstained: Ellen Eggerton, Drake Erbe, Skip Ernst
  - **Motion to approve as modified Kevin Rose, seconded by John Bade. Passed 12-1-4.**
    - No: Laura Petrillo-Groh.
    - Abstain: Mark Heizer, Ellen Eggerton, Drake Erbe, Skip Ernst.
- c. CEPI-105, DX Condenser Fan Control, Glory O'Brien
- Proponent was not on the call
  - Dick Lord (Carrier) noted that it is preempted. John Bade (California Investor Owned Utilities) agreed.
  - Skip Ernst said that this is not well-crafted. There are other ways to provide modulating control.
  - Laura Petrillo-Groh stated that the added cost is not defined, and the proposal violates preemption.
  - **John Bade moved to disapprove, Dick Lord seconded. Passed 14-0-1.**
    - Abstained: Chris Perry.
- d. CEPI-107, Direct Digital Control Airflow Rates, Emily Toto
- John Bade (California Investor Owned Utilities) spoke for the proponent.
  - **Jim Yoeman moved to approve, seconded by Drake Erbe. Passed 16-0-0.** Reason statement as shown in the proposal.
- e. CEPI-009, Kitchen Exhaust, Nicholas O'Neil
- Nick O'Neil (NEEA) spoke as the proponent
    - Has been required for some time, and this clarifies the requirements.
    - Allows method of sensing to be more general.
    - Moves some of the requirements to the charging language.
    - Mark Heizer (Oregon Bldg Codes Div)
      - Said that removing the requirement for UL 710 is a problem because IMC allows going below when meeting UL 710. In violation of the IMC if the hood is not rated to UL 710.
      - IMC prohibits energy recovery in these applications. Proponent noted that it is in the existing language.
        - Ellen Eggerton (City of Alexandria) asked and received confirmation that energy recovery is allowed on non-grease hoods.
        - John Bade suggested adding "where allowed by the IMC" to the exception. The proponent agreed
    - Proponent agreed to add the requirement for UL 710 back in.
  - **Ellen Eggerton moved approve with modifications, Kevin Rose seconded. Passed 14-0-1 Reason statement: standing on the reason statement as shown in the proposal.**
    - Abstained: Skip Ernst.

f. CEPI-112, Energy Recovery, Series, Emily Toto

- John Bade (California Investor Owned Utilities) spoke for the proposal.
- Thomas Schultz (Spire & AGA) – would like to hear from DX-DOAS manufacturers. Skip Ernst (Daikin) said that it is a good way to do this.
- Jon McHugh (California Investor Owned Utilities) asked about minimum effectiveness
- **Mark Heizer (Oregon Bldg Codes Div) moved to approve as modified, seconded by Ellen Eggerton. Passed 13-0-1. Reason statement as shown in the proposal.**
  - Frank Morrison abstained.

g. CEPI-113, ERV Nontransient Dwelling Units, Mike Moore

- Mike Moore (Home Ventilation Institute) spoke as the proponent.
  - Recent research shows that there is a lot of leakage to corridors in multifamily.
  - Codes now do not allow corridors to provide ventilation air.
  - Balanced ventilation is needed to meet mechanical codes.
- Skip Ernst (Daikin) asked why the open-ended corridor/no corridor to exception 2. The proponent explained that research shows that there is significant leakage between closed corridors and apartments.
- Drake Erbe (ASHRAE) asked how one ensures that air moves in and out under a balanced ventilation system. Proponent said that the IMC does not speak to such requirements.
  - Agrees with not adding a requirement for balanced ventilation.
- Ben Levie (USFC) asked who Mike Moore represented and asked where the data came from. The proponent noted that the original language came from analysis 90.1. For the change to the exception, two units were modeled.
- Mark Heizer (Oregon Bldg Codes Div)
  - Noted that Exception 2 is being tightened to essentially garden apartments, and new exception 3 adds back small apartments in 1A, 2B, 3B, and 3C.
- Ellen Eggerton moved to accept the modifications, seconded by John Bade. Passed 14-0-1 Drake Erbe abstained.
- **Ellen Eggerton moved to accept the proposal, seconded by John Bade. Passed 13-0-3.**
  - Drake Erbe, Mark Heizer, and Blake Shelide abstained.

h. CEPI-114, Energy Recovery, Exception 8, Glory O'Brien

- The proponent was not here to speak for the proposal.
- John Bade (California Investor Owned Utilities) likes the idea, but thinks the language is not clear enough.
- Drake Erbe (ASHRAE) would like to send this out to get comments.
- Thomas Schultz (Spire and AGA) said that the language calling out intentionally circumventing is not good code language.
- Mark Heizer (Oregon Building Codes Division) – the language is not enforceable. He really wants to fix the problem, but he does not think this is it.
- Skip Ernst (Daikin) – Does not understand how the proposed language fixes the problem.

- John Bade (California Investor Owned Utilities) supported creating a working group to make the language good enough to vote out for comments. Drake Erbe agreed.
- **Mark Heizer moved to table and bring back on April 14 John Bade seconded. Passed 15-0-0.**
  - Working Group: John Bade, Drake Erbe, Skip Ernst, Dick Lord

**Special motion:** Ellen Eggerton moved to hear CEPI-76 ahead of CEPI-117, seconded by Chris Perry. Passed 16-0-0

- i. CEPI-117, ERV other spaces, Glory O'Brien
  - Moved to the March 24 meeting.
- j. CEPI-76, HVAC Total System Performance, Jeremy Williams.
  - Reid Hart (PNNL) presented on the TSPR concept.
  - Skip Ernst (Daikin) asked if only EER is supported for part load. Reid noted that they are working on a way to allow the entry of IEER.
  - Lisa Rosenow (NEEA) spoke in support of the provision. Her company provides user support for a very similar program in Washington State.
    - Designers appreciate the flexibility in design that is allowed.
    - The reports are excellent.
  - Ben Levie (UCSF)
    - Concerned that the software does not cover complex systems. Reid noted that TSPR is intended for simpler buildings.
  - Chris Perry (DOE)
    - DOE would like to see a move to performance paths and this proposal supports this direction.
  - Richard Lord (Carrier)
    - Is very concerned that the software created by PNNL only accepts full-load EER as an input. He stated that using EER to calculate part-load performance can lead to errors of up to 60 percent.
    - He noted that this is an industry problem, since many manufacturers do not provide part-load performance data useful for modeling.
  - Laura Petrillo-Groh (AHRI)
    - Same concerns as Dick Lord
    - Noted that the alternate path must allow minimum efficiency equipment
  - John Bade (California Investor Owned Utilities) – Noted that as Dick Lord stated, the problem is that industry, to date, has not supplied the curves. Further, the current performance paths allow the use of EER to determine part load performance. The IECC should not wait for industry to act.
  - Thomas Schultz (Spire and AGA) – How does this compare to the EPA software? Reid Hart responded that EPA applies to downstream of design on existing buildings, while this applies to buildings under design.
  - Drake Erbe (ASHRAE)
    - Designers need to look at systems.
    - Asked if the proposal aligns with 90.1. Reid confirmed that it is closely aligned with 90.1.

- Drake pointed out that this is likely to help jurisdictions and obviate the need for them to create their own rules or software.
- Laura Petrillo-Groh (AHRI)
  - Wanted to confirm that anybody can make software.
  - Concerned that small manufacturers would be disadvantaged because they cannot make software.
    - John Bade (California Investor Owned Utilities) responded
      - The two large manufacturers that offer software that supports the existing performance methods are already advantaged. They have spent much time and resources to create that software.
      - Based on his experience, it is likely that independent software makers will offer to add smaller manufacturers' equipment to their programs for a feed.
- Dick Lord (Carrier)
  - Concerned that manufacturers using the simplified approach will overstate their performance because using EER can overstate part-load results.
  - Should be forcing good performance models.
- Ellen Eggerton (City of Alexandria)
  - Supports as an optional tool.
  - Made a friendly amendment to call out occupancy groups rather than example occupancies.
- **Ellen Eggerton moved to approve as modified. Chris Perry seconded. Passed 9-5-1**
  - No votes from Laura Petrillo-Groh, Dick Lord, Henry Ernst, Thomas Schultz, and Doug Tucker. Ben Levie abstained.

All the following proposals are moved to the March 24, 2022, meeting:

- k CEPI-64, HVAC operable Opening Exception, Glory O'Brien
- l CEPI-65, Operable Opening Interlocking, Lisa Rosenow
- m CEPI-103, Economizer Exception, John Bade
- n CEPI-104, Economizer Exception, Glory O'Brien
- o CEPI-115, Enthalpy Recover, Glory O'Brien
- p CEPI-116, Exhaust Air Recovery, Emily Toto

#### 9. Other business.

- a. Discuss order for hearing proposals for next meeting. We will pick up with CEPI-117 and complete the items from today's agenda.
- b. Identify and schedule discussion dates for proposals that were sent to us from other subcommittees, if applicable. None so far.
- c. The vice-chair said that a new chair will likely be appointed at the next meeting of the IECC Commercial Consensus Committee on March 16, 2022.

#### 11. Upcoming meetings.

- a. Second and fourth Thursday of each month, 11:00am – 2:00pm Eastern Time  
Next meeting is March 24, 2022.

#### 12. Adjourn. Motion to adjourn Blake Shelide, seconded by John Bade.

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FOR ADDITIONAL INFORMATION, PLEASE CONTACT Blake Shelide, Subcommittee Vice-Chair at [blake.shelide@energy.oregon.gov](mailto:blake.shelide@energy.oregon.gov)