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**International Energy Conservation Code**

**E4C-HVACR Subcommittee**

**Meeting Notes**

January 12, 2023

11:00 AM EDT to 1:00 PM EST

[Webex](https://iccsafe.webex.com/wbxmjs/joinservice/sites/iccsafe/meeting/download/a2ae165237cf4cf8940298b4b44b13ac?siteurl=iccsafe&MTID=m2b51d8a029d849a899926a355b5ce5b8) Link

**Committee Chair:** John Bade, representing the California Investor Owned Utilities

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

1. **Call to order**-Chair or vice-chair

2**. Meeting Conduct**. Staff

a. Identification of Representation/Conflict of Interest

b. ICC [Council Policy 7](https://www.iccsafe.org/wp-content/uploads/CP07-04.pdf) Committees: Section 5.1.10 Representation of Interests

c. ICC [Code of Ethics](https://www.iccsafe.org/wp-content/uploads/CodeOfEthics.pdf): 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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **First Name** | **Last Name** | **Category** | **Company** |
|  | Christopher | Arnold | Consumer | Grand forks Public Schools |
|  | John | Bade | Utility | 2050 Partners |
|  | Drake | Erbe | Standards Promulgator | ASHRAE |
|  | Henry | Ernst | Manufacturer | Daiken |
|  | Mark | Heizer | Gov. Regulator | Oregon Bldg Codes Div |
|  | Gary | Klein | User | Self |
|  | Jeff | Kleiss | Manufacturer | Lochinvar (AO Smith) |
|  | Benjamin | Levie | Consumer | UCSF |
|  | Dick | Lord | Manufacturer | Carrier |
|  | Frank | Morrison | Manufacturer | Baltimore Aircoil |
|  | Christopher | Perry | Gov. Regulator | US DOE |
|  | Daniel | Nall | Gov. Regulator | Dan Nall Consultant/ AIA |
|  | Laura | Petrillo-Groh | Manufacturer | AHRI |
|  | Kevin | Rose | Public Segment | NEEA (joined late) |
|  | Shannon | Corcoran | Utility | American Gas Assoc. |
|  | Blake | Shelide | Gov. Regulator | Oregon Dept of Energy |
|  | Amin | Tohmaz | Gov. Regulator | City of San Antonio |
|  | Doug | Tucker | Manufacturer | Mitsubishi |
|  | Jeremy | Williams | Gov. Regulator | US DOE |
|  | James | Yeoman | Gov. Regulator | City of Orem |

4. **Review of Notes** June 9, 2022, December 1, 2022, and December 15 meetings. Per staff direction, subcommittees do not have minutes, but notes. These do not need a vote.

5. **Approval of Agenda**

Dick Lord (Carrier)

* Mentioned Steve Taylor worked on “Reset for the thermostat” to discuss if time permits.

Motion: Dick Lord has the motion to approve the agenda, and Blake Shelide seconded.

Vote: 8-0-2, Gary Klein and the chair abstained.

6. **Old Business** - none

7. **Review and possibly vote on the following public comments**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Proposal Number** | **Code Section(s)** | **description** | **proponent** | **Subcommittee Member Lead** |
| CED1-178-22 | C409.1 | Deletion of TSPR Section | Ted Williams | Blake Shelide |  |
| CED1-179-22 | CE101.1 | Deletion of Appendix CE | Ted Williams | Blake Shelide |  |
| CED1-152-22 | C202 | DOAS definition correction | Nicholas O'Neil | John Bade |
| CED1-172-22 | C406.2 Table | W09 SHW flow adjustments | Reid Hart | Dan Nall, Chris Perry, Doug Maddox, Gary Klein |  |
| CED1-173-22 | C406.2.2.5 | H05 DOAS energy credit clarification | Reid Hart | Dan Nall, Chris Perry, Doug Maddox, Gary Klein, , Laura Petrilloh Groh |  |
| CED1-174-22 | C406.2.3.2 | W05 Point of use water heaters | Reid Hart | Dan Nall, Chris Perry, Doug Maddox, Gary Klein |  |
| CED1-176-22 | C406.3.7 | G06 SHW demand response | Reid Hart | Dan Nall, Chris Perry, Doug Maddox, Gary Klein | 12-Jan |
| CED1-165-22 | C403.7.1 | Demand control ventilation exception | Thomas Nagy | Doug Maddox/ Michael Tillou | 12-Jan Talked to commenter. Circulating around PNNL |

**CED1-178-22**

Ted Williams

* The proposals, CED1-178 and CED1-179, do not include the TSPR approach at the IECC currently.
* The work was done ad hoc and was supported by analysis.
* The analysis is not as transparent as it should be.
* The requirements collectively or individually are not economically justified by the building owner.
* It’s a creative approach but can be extremely burdensome.

Dick Lord (Carrier)

* It’s an option, and users don’t have to do it.
* Have some concerns with TSPR as underlying modeling may be flawed.

Ted Williams

* It’s an option in a modeling code. It might be implemented as adopting a code
* It's in a requirement section of code. It might change at a local jurisdiction.

Laura Petrillo-Groh (AHRI)

* Worked closely with Reid and his team to examine products and whether they would be able to meet TSPR or be used within the TSPR environment. We were very granular with the approach.
* The work done by the PNNL team prevents preemption concerns.

Ted Williams

* Agreed that the preemption issue was considered.
* The level of granularity is going to be very hard for somebody to justify the requirements.

Motion: Blake Shelide moved to disapprove the comment. Gary Klein seconded.

Reason statement: TSPR is an optional path to comply, not necessarily more efficient.

Vote- 8-1-1 Skip Ernst against, the chair abstained.

**CED1-179**

Ted Williams

* The reason is as mentioned in the previous proposal.
* The appendix that requires the use of TSPR is required for all buildings. It is a lack of economic justification.

Mike Tillou (PNNL)

* This appendix provides an optional language for a jurisdiction to consider for the increase the energy efficiency that the TSPR pathway delivers.
* It is an optional language that complements the language that has been proposed for the main body of the standard.
* Can be used if the jurisdiction wanted to more a higher level of energy efficiency. TSPR is looking at HVAC systems as a whole as an entire system, not just individual pieces of equipment.
* The proposed appendix allows to the adoption of a higher level of overall HVAC system efficiency.

Laura Petrillo-Groh (AHRI)

* Noted that if jurisdictions did increase the efficiency requirements of TSPR, they would be at risk of violating preemption.

Mike Tillou (PNNL)

* The original TSPR proposal (CEPI 76) included the optional appendix language that set different targets on the optional TSPR pathway.
* The proposed targets in the appendix were established to achieve a 5% increase in overall HVAC system efficiency relative to the minimum prescriptive requirements. It doesn't change anything in the base TSPR language.
* There are lots of aspects of the HVAC system that would not rely on minimum efficient equipment that could be utilized to gain additional efficiency.

Laura Petrillo-Groh (AHRI)

* If a jurisdiction did adopt this as part of its base building code, by definition, it would not be able to meet the mechanical system using minimum efficiency equipment.
* It will not be applicable for a hotel, the system that is used in TSPR for the rooms is minimum efficiency PTAC. It will be a trade-off for just being energy and pumping power to the single packaged product.

Mike Tillou (PNNL)

* Will discuss this with Reid Hart for further clarification.

Vladmir Kochkin (NHAB)

* Casted a negative vote on ASHRAE and later the preemption issue was resolved at ASHRAE. Federal preemption will be treated in this adaptable appendix for jurisdiction.

Dick Lord (Carrier)

* This is duplicating the credits, as we are implementing this twice.

Mike Tillou (PNNL)

* It could be a potential overlap.

Ben Levie (UCSF)

* Since PTAC doesn't have any extra pieces associated with them, why would it be a part of this table?

Dick Lord (Carrier)

* It is a system approach. PTAC in the room and there is DOAS in the room which also affects the system.

Laura Petrillo-Groh (AHRI)

* Each of these systems has a baseline system associated with it and it’s also covered in 90.1.

Motion: Gary Klein motioned to table until Feb 23rd, and Drake Erbe seconded.

We need more information before taking the decision.

Vote: 10-0-1, the Chair abstained.

The proponent, Ted William, will attend the meeting.

Mike Tillou (PNNL)

* The two items will be addressed for further information from Reid Hart:
  + The extra 5% represents a potential impact on preemption based on the work that PNNL did with AHRI on the base TSPR language
  + Whether there's an overlap with energy credits.

John Bade (California Investor Owned Utilities)

* May be resolved by modifying the table by exempting products (PTAC).

Chris Perry (US DOE)

* Reid may have already modeled considering PTAC. Make adjustments for the products which were not considered.

Dick Lord (Carrier)

* Not all products are covered by TSPR.

John Bade (California Investor Owned Utilities)

* The chillers beyond the minimum chiller efficiencies are not preempted

Mike Tillou will organize the meeting after discussing it with Reid and will form an informal WG including Ted Williams, Laura, and John Bade.

**CED1-172**

Mike Tillou (PNNL)

* The proposed change is set up to align the new requirements in the uniform plumbing code which recently lowered the flow limit for shower heads from 2½ gpm to 2 gpm. This change adjusts the baseline for the energy credits for WO 9 to use that new baseline. The achievable credits for this credit were substantially reduced. There's less savings available from this credit. This public comment is to make that adjustment within or credit WO 9.

Greg Johnson (NAHB)

* How sensitive is the analysis? How much change do we need to make to achieve this new number?

Mike Tillou (PNNL)

* The original credit was based on about a one gpm difference in flow, the new requirements reduce the baseline by ½.
* The two-part adjustment (baseline increase and saving flow in the credit) explains why the credit is down so much.
* Tried to make sure that the credit is achievable and reachable and products can meet the proposed flow reductions.

John Bade (California Investor Owned Utilities)

* Walked through the changes.

Mike Tillou (PNNL)

* Change in unit is in alignment with what's in the uniform.

Vladmir Koc

* Is there a parallel proposal that adjusts the threshold requirements?

Mike Tillou (PNNL)

* Will clarify with Reid.

Gary Klein

* Assuming it is international plumbing code, not uniform plumbing code.

John Bade (California Investor Owned Utilities)

* The reason statement refers to the uniform plumbing code.

Gary Klein

* The potential for savings has gone down rather dramatically by the proposed changes.

Laura Petrillo-Groh (AHRI)

* Reid did count for the package in 190.
* Asked to check the threshold for R2 occupancies.

Vladmir Kochkin

* Is it possible in some jurisdictions folks adopted a uniform plumbing code for plumbing, but then the IECC energy code for energy?

Gary Klein

* 8 states adopt plumbing and California has its own energy code. Big cities adopt even their state doesn’t.

Motion: Gary Klein motioned to table until Feb 23rd and Laura Petrillo-Groh seconded.

We need more information from Reid Hart for further clarification.

Gary Klein

* We need to resolve two items:
  + A clarification question- why l/min, not l/sec?
  + How the reduction in credits came about.

Laura Petrillo-Groh (AHRI)

* To verify the cost-effectiveness and the threshold numbers for the multifamily dormitory occupancies are appropriately adjusted since this measure was used in the base package for cost-effectiveness.

Vote: 10-0-1, the chair abstained.

**CED1-152**

Mike Moore

* Originally submitted by Nick.
* Gave an overview of the changes.
* IMC doesn't provide similar occupancy classification, density zoning distribution effectiveness, primary air flow rate, etc.

Greg Johnson

* Need more consistency or need to provide direction to the 2021 IMC table 403.3.1.1. Otherwise, we don't know what a similar occupancy classification is.

Mike Moore

* We can mention table references or mention the table reference in ASHRAE 62.1.
* Can't use that same term zone already used in the IMC because the IECC has the definition for the zone which is related to space conditioning.

John Bade (California Investor Owned Utilities)

* We talked about this 90.1 two years ago.
* We can do the ventilation zone by removing “the temperature” in the definition.

Mike Moore

* Agreed with the change as it's less specific and probably better for an energy code.

Greg Johnson

* Agreed on the change.

Laura Petrillo-Groh (AHRI)

* Some of the spaces that are covered by IECC would fall under the scope of ASHRAE 62.2. The dwelling unit classification are being specific to the ventilation zone. Are we excluding some of these residential spaces for example multifamily buildings?

Mike Moore

* We don’t need to include 62.2.
* This new definition John suggested is going to be better and covered without any of the external references.

Laura Petrillo-Groh (AHRI)

* Concern about the capability of supplying 100% outdoor air.

Skip Ernst (Daiken)

* Confused by “downstream” of the dedicated fan. DOAS system can’t be downstream

Mike Moore

* The central fan integrated systems would not be considered a dedicated outdoor air system. It has an outdoor air duct, but the fan is downstream of the outdoor air. They can't supply 100% outdoor air downstream of the fan.

John Bade (California Investor Owned Utilities)

* Proposed changes by removing “downstream”

Skip Ernst (Daiken)

* Agreed with John’s change.
* The DOAS system is designed to handle 100% outdoor air. There are situations where it allows a mixing box and return air.

Mike Tillou and John Bade modified the new definition of the ventilation zone.

Dick Lord (Carrier)

* Concerned with the definition of outdoor air DOAS being different in different standards.

John Bade (California Investor Owned Utilities)

* The whole point of this definition is that it's not a mixed air system.
* The reason for this definition is to make it clear that the air is going to space and it's not mixing with ventilation air from other spaces. Also, it could feed through a terminal unit.
* Other codes provide the requirement for filtration.
* This definition would not allow a system where air goes through a central HVAC coil.
* For a central VAV system, the ventilation air will be mixed with recirculation air from other ventilation zones. Fan coil or water source heat pump serves space and will mix with recirculated air but just from the same ventilation zone.
* It will not be applicable to the bathroom fan as it is an exhaust system. Residentially in an apartment is a single ventilation zone because there's a single set point for the entire apartment.

Laura Petrillo-Groh (AHRI)

* Can’t support this definition as not comfortable of using all fans under a dedicated outdoor system.

Mike Tillou (PNNL)

* Prefer to reference ASHARE 62.1
* The intent is that we expect people to use the IMC or ASHRAE 62 which would bring in zone air distribution effect.

John Bade (California Investor Owned Utilities)

* IECC doesn’t apply to hospital.
* 90.1 required to comply with applicable codes or accreditation standards.

Drake Erbe (ASHRAE)

* The definition of the dedicated outdoor air system is not consistent. Not supporting the definition without an additional investigation.

Laura Petrillo-Groh (AHRI)

* Concerned whether some products fall under the definition. For example, air-cooled DX-DOAS.

John Bade (California Investor Owned Utilities)

* Confirmed that certain products fall under the definition. It’s a broad definition. It's says that this system does not mix outdoor air with recirculated air from other spaces.
* Plenum fans can be treated as a dedicated outdoor air system.

Mike Moore

* All changes are the modifications to include ensuring that all the right systems are included when it's being referenced.

John Bade (California Investor Owned Utilities)

* The problem with the definition that went through is that it may consider an SPVU with a duct to the outdoor in the side treated as DOAS.

Mike Moore

* The 2021 version doesn’t have a definition and the 2022 version has a broken definition.

Dick Lord (Carrier)

* Feeding air through another unit is taking credit for cycling the fans assume fans have to run all the time.
* The economic analysis of DOAS proposals that are going in states is flawed.

Motion: Skip Ernst motioned to table until Jan 26th, and Gary Klein seconded.

Vote: 10-0-1, the chair abstained.

Mike Tillou will organize the meeting.

8. **Updates on other public comments**. Reports from subcommittee response leads on progress working with commenters.

9. **Comments for the next meeting**. Finalize the list of comments to be discussed at the January 26, 2023 meeting.

| **Proposal Number** | **Code Section(s)** | **Description** | **Proponent** | **Subcommittee Member Lead** | **Scheduled HVACR and Water Heating Subcommittee Hearing Date** |
| --- | --- | --- | --- | --- | --- |
| CED1-166-22 | C403.7.2 | Parking garage ventilation modifications | Greg Johnson | Laura Petrillo-Groh |  |
| CED1-169-22 | C403.8.1 | Fan Power proposal modifications | Laura Petrillo-Groh | Skip Ernst |  |
| CED1-156-22 | C403.3.2 | Update efficiency tables to match ASHRAE 90.1 | Steven Rosenstock | John Bade |  |
| CED1-157-22 | C403.3.2(6) Table | Boiler table | Nicholas O'Neil |  | Hold pending court case |
| CED1-161-22 | C403.4.6 | HVAC demand response | Reid Hart | Dan Nall, Chris Perry, Doug Maddox, Gary Klein, Laura Petrillo-Groh |  |
| CED1-162-22 | C403.4.6 | Demand responsive space conditioning | Alex Smith | Doug Maddox |  |
| CED1-167-22 | C403.7.4 | Nontransient dwelling units HRV/ERV exception | Alex Smith | John Bade |  |
| CED1-170-22 | C404.10 | Demand response water heaters exception | Greg Johnson | Doug Maddox |  |
| ~~CED1-175-22~~ | ~~C406.3~~ | ~~Load management and renewable intro~~ | ~~Reid Hart~~ | ~~Dan Nall, Chris Perry, Doug Maddox, Gary Klein~~ | Removed to Modeling Subcommittee |
| CED1-177-22 | C408.2 | Mechanical systems SWH commissioning reqs | Aaron McEwin | Jeff Kleiss |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

10. **Other business**.

* Members to bring up any new business

John Bade (California Investor Owned Utilities)

Because of a conflict with travel from the ASHRAE Winter Meeting, we will reschedule the February 9, 2023 meeting to Friday, Feb 15 ,2023 at 2 pm ET for 3-hour meeting.

11. **Upcoming meetings**.

a. January 26, 2023 at 11:00 a.m. to 1:00 p.m. Eastern Time and every two weeks thereafter

12. **Adjourn**.

FOR FURTHER INFORMATION BE SURE TO VISIT THE ICC WEBSITE:

[ICC Energy webpage](https://www.iccsafe.org/products-and-services/codes-standards/energy/)

[Code Change Monograph](https://www.iccsafe.org/wp-content/uploads/2021-Public-Input-Complete-Monograph.pdf)

FOR ADDITIONAL INFORMATION, PLEASE CONTACT EITHER

* John Bade, Subcommittee Chair at [johnbade@2050partners.com](mailto:johnbade@2050partners.com).
* Blake Shelide, Subcommittee Vice-Chair at [blake.shelide@energy.oregon.gov](mailto:blake.shelide@energy.oregon.gov)

**Motion**: Blake Shelide motioned to adjourn and Gary Klein seconded.

**Message from the Chat:**

from Michael Tillou to Everyone: 9:59 AM

Michael Tillou, PNNL

from Greg Johnson to Everyone: 9:59 AM

Greg Johnson National Multifamily Housing Council

from jim Earley to Everyone: 10:00 AM

Jim Earley, Edison Electric Institute, Guest

from Jason Vandever - NAIMA to Everyone: 10:00 AM

Jason Vandever - NAIMA

from Chris Perry to Everyone: 10:01 AM

Chris Perry, DOE

from Aaron R. Phillips to Everyone: 10:01 AM

Aaron R. Phillips, Asphalt Roofing Manufacturers Association

from Alex Smith to Everyone: 10:01 AM

Alex Smith - NAHB

from Ted Williams, NGCLLC for NPGA/Omega Flext to Everyone: 10:04 AM

Ted Williams, Natural Gas Direct representing ONE Gas

from Kevin Rose to Everyone: 10:25 AM

Kevin Rose, NEEA. Apologies for joining late.

from Michael Tillou to Everyone: 10:40 AM

I would say table to a meeting in first 2 weeks of Feb

from Kristopher Stenger to Everyone: 10:43 AM

if you want to reschedule the 9th your options are Friday, Feb 10 at 2pm eastern or Wednesday, Feb 15 at 2pm Eastern

from Mike Moore to Everyone: 10:50 AM

I was multitasking and missed the action on CED1-152-22, DOAS definition. Could someone bring me up to speed?

from Laura Petrillo-Groh to Everyone: 10:52 AM

CED1-152 has not yet been discussed, Mike

from Mike Moore to Everyone: 10:53 AM

Thanks, Laura.

from Laura Petrillo-Groh to Everyone: 10:56 AM

audio was disconnected

from Laura Petrillo-Groh to Everyone: 10:56 AM

rejoining now

from Laura Petrillo-Groh to Everyone: 10:56 AM

back :)

from Michael Tillou to Everyone: 11:46 AM

accredidation has 2 d's not 2 t's