

Commercial Prescriptive Path and Renewables Working Group

Meeting #3

June 14, 2022

3 p.m. – 4 p.m.

Introductions:

1. CASR: Katrina Managan, Jonny Rogers, Sharon Jaye, Courtney Anderson, Tom Gleason
2. CPD: Chuck Bartel, Robert Pruett, Antonio Navarra
3. Attendees: Sean Denniston (NBI), Elizabeth Gillmor (Energetics)

Review Updated Prescriptive Proposal: (Sean)

1. Addressed emergency back-up power by adding it to the definition for all-electric in both commercial and residential. Captured definition of emergency power system and standby power system from IBC. Proposal doesn't distinguish between required and voluntary systems. Also made slight adjustment to a couple of the point values because the direction for all-electric water heating went to allowing electric resistance. If electric resistance is the entry point, that lowers the value of this measure. There are also credit options for electric space heating and electric water heating. No double counting for efficient electric space heating. Requirements for electric resistance heat and requirements for heat pumps. When it's a heat pump there's a requirement for a cold climate heat pump, and the exception is a regular heat pump that is also provided with energy recovery ventilation.

Summary of Topics Discussed:

1. Tiered Approach to Incentivize Efficiency and Electrification
2. Emergency and Back-up Power Systems
3. ERV's
4. Water Heating
5. Space Heating

Discussion/Detailed Notes:

Tiered Approach to Incentivize Efficiency and Electrification

1. Elizabeth: our whole goal is to try to get buildings off gas heating. If they can change a gas rooftop unit to a heat pump rooftop unit, please just give them credit for it. Don't make that

heat pump rooftop unit so expensive and so hard to get that they give up. I'm already battling that right now. I've got supply chain issues with rooftop heat pump units, I've just had three projects in the last month have to change from a packaged heat pump roof top unit to a gas rooftop unit because they couldn't find it, much less can I find it in this efficiency. Let's just start with all electric before we start to pinch down the efficiencies so much.

- a. Katrina: Elizabeth, you would propose that it's just heat pump equipment that gets credit and exclude electric resistance?
 - b. Elizabeth: I think maybe you've got two different things going on here. There's going all electric, and then the energy recovery and whatnot. These efficiency standards going down to 5 degrees, that's still costs more. Does it cost 80% more? I don't know, but whether we lump this all into a single category just for a building to be considered all-electric heating, I think is a separate question from what this does to energy costs. You can split out the energy recovery element into maybe a separate point category where it's not already required or something like that. But I don't think these are the standards that we should set to consider a building to be all-electric space heating.
 - c. Antonio: agree with Elizabeth we can't go from 0 to 100
2. Katrina: Can I ask just the question again on operating costs? When asked the question about operating costs, should we just say yes, a whole lot of these buildings are going to cost a lot more to operate or that we say you get more points in some way if you do a cold climate heat pump or add it an ERV system so that we are still incentivizing lower operating costs, but you get some points for doing a minimal heat pump?
- a. Elizabeth: first step, get off a gas. Second step, let's manage costs. Let's split out and then do the energy recovery as a second set of points to then encourage that. Can we do all-electric basic efficiency, all electric high efficiency, all electric high efficiency and ERV, you know this is almost three tiers that you can do three sets of points for to incentivize lower cost to operate, but I'm still struggling to get people to that first step. Putting all three steps is a tough sell.

Emergency and Back-up Power Systems

3. Katrina/Chuck: Are emergency power system and standby power system defined terms in other parts of the code?
- a. Sean: They're defined terms in other parts of the code. Systems for power loss as opposed emergency situations that could be a broader set of circumstances is covered

under standby power systems. But I would certainly appreciate a review by whoever is enforcing the code for these sorts of systems to make sure. We've tried to keep it very simple— if it's present, it's exempted from the definition of all-electric.

- b. Chuck: I like that approach. I just want to make sure there are no unintended consequences created by using defined terms from other codes
- c. Chuck will follow-up with those in CPD who are appropriate to review this language.

ERV's

- 4. Sean: If you have an application where there's no cold climate heat pump that can meet the need and the IMC prohibits you from using any kind of energy recovery ventilation, you won't really be able to use this option. Because this is a credit option and it's not mandatory, is that okay or do we need to find another path?
- 5. Elizabeth: I don't know of a single packaged terminal heat pump where I could document a COP of not less than 1.5 when operating at 5 degrees. I have the same problem with number two, those are also challenging metrics to achieve. We want to incentivize projects to get off gas, but this makes going electric harder. Code needs to incentivize all-electric.
 - a. Sean: you have to have one or the other – either a cold-climate heat pump or a heat pump with an ERV
 - b. Elizabeth: if I have an affordable housing project that uses natural ventilation with a PTAC that would not be considered all electric. It doesn't need an ERV because it's not bringing in mechanically ducted outside air. It could survive without that. We actually increase the energy use by adding an ERV.
 - c. Chuck: I've heard the rule of 3 – there should be 3 manufacturers that produce a piece of equipment for it to be considered available.
 - d. Sean: these were the 3 basic paths laid out by the group in the last meeting, either do high efficiency envelope with resistance heat, cold climate heat pump, or a standard heat pump with ERV for ventilation
 - e. Elizabeth: I'll object to anything that restricts the efficiencies of PTACs and VTACs because I don't have any options there. They don't exist.
- 6. Chuck: going the prescriptive path for dwelling units ERVs are going to be required – it's minimum code. Are we rewarding or giving credit or extra credit for using an ERV that's already required elsewhere in code?

- a. Sean: There is the requirement for ERV in in the main body of the code, where it's the dwelling units that we've talked about, non-transient only and then it's required. Basically, it depends on the percent of outdoor air that the system utilizes and the flow rate. That does then raise a question of how often the ERV requirement is being triggered in buildings in Denver because it is mandatory for certain buildings, but not every building is going to be over that threshold. I'm curious if we have a sense of how often it's required.
 - b. Chuck: we're seeing it more often than previously, but a large percentage of buildings are not required to use it
7. Sean: if ERVs then become mandatory in dwelling units that manages that can help manage energy costs for dwelling units, that does still leave the issue of energy cost for code compliant heat pumps and commercial nonresidential commercial occupancies, but does that address the cost issue, energy cost issue enough or does it need to go beyond that?
- a. Chuck: 2021 base code allows exhaust only ventilation and 2021 or 2022 Denver amendments are going to require some sort of makeup air to each unit. I would predict that we'll see more ERVs in dwelling units.

Water Heating

8. Sean: electric water heating backed off from HPWH to just electric water heating equipment (allowing for electric resistance) – we have another proposal, electrification readiness, for HPWH readiness, but if that proposal doesn't pass do, we need to have HPWH readiness in this proposal?
- a. Elizabeth: I like the idea of including electric resistance and requiring the readiness. I would encourage again that second tier, so you get extra credit for HPWHs
9. Sean: how to deal with instantaneous electric water heaters for HPWH readiness. Approach I took here is to call out instantaneous water heaters located within 6 feet of the point of use to exclude really big electric instantaneous water heaters.
10. Chuck: I like where this is headed. Getting a tiered approach for the different types of electric resistance and HPWHs would be fantastic.

Space Heating

1. Katrina: Sean, are you saying we might just say heat pump equipment? Elizabeth and Chuck, are you comfortable with that?
- a. Elizabeth: I think so. Do we want to encourage VAV with electric reheat as an all-electric

project? Could we fit that into step one of our all-electric space heating?

- b. Sean: It would depend on how the system was designed. The exception could be a VAV with a heat pump as it's central and then still electric resistance reheat.
- c. Elizabeth: Right now, you could define what is the delta temperature between that reheat. You know you could require the VAV system have like an outdoor air reset so that you're getting the most out of that heat pump you can maybe you require that reset to go up to 65 where you know the norm is 60 and the typical supplier temperature is 55. So, you can require that that system makes the most out of the heat pump and that does have a huge impact and minimizing the electric reheat that's a design standard we do now.

2. Next steps/upcoming meeting topics:

- a. 6/28: Final meeting

Meeting adjourned