IECC/DGC Energy Committee Supplemental Hearing #7
June 21, 2022

1. **Attendees:**

Name of CCD Committee Member	Organization	In Attendance?
Christy Collins	City and County of Denver (CCD)	X
Chuck Bartel	CCD	
Allen Yanong	CCD	
Courtney Anderson	CCD	X
Eric Browning	CCD	X
Paul Schaffer	CCD	X
Mike Walton	CCD	X
Antonio Navarra	CCD	X
Tom Gleason	CCD	X
Robert Pruett	CCD	X
Robby Schwarz	BUILDTank Inc.	X
Nathan Kahre	Energy Logic	X
John Arent	Noresco	
Elizabeth Gillmor	Energetics	X
Aaron Esselink	Xcel Energy	X
Mark Rodriguez	Sun Run	
Mark Jelinske	RMH Group	X
John Dutch	Koebel Co	X
Jamy Bacchus	ME Engineers	X
Ashleigh Wheeler	Denver Housing Authority	X

2. Meeting purpose: Not going to be able to discuss all proposals in hearing agendas – having supplemental discussions to vet proposals for advancement. Want to be transparent, recording meetings and posting minutes so members of the public can know what we're talking about.

3. Discussion and voting on IECC/DGC Energy
   a. #100 DGC NZE Path
   b. #32 Commercial Grid Flexible Thermostat
   c. #69 Residential Grid Flexible Thermostat
      ▪ #69B Residential Grid Flexible Thermostat for DGC
   d. #38 Commercial Grid Flexible Water Heating
   e. #70 Residential Grid Flexible Water Heating
      ▪ #70B Residential Grid Flexible Water Heating for DGC
   f. #36 Commercial Grid Flexible Lighting

[#32](#) *Commercial Grid Flexible Thermostat: Sean (NBI) on behalf of Denver*

      a. Proposal overview: Demand responsive controls to increase or decrease heating/cooling set points to shed grid load or to pre-cool or pre-heat in anticipation of large grid demand. Exceptions for health care and assisted living temperature control. The thermostat can't depend on these demand responsive signals for basic functionality. This is a capability, not participation. It's up to the occupant or the building owner to decide whether or not to participate.

Discussion:

      a. Aaron: Are there limitations on the type of thermostat that you're looking at. There's no commercial heating demand response program
            i. Sean: the focus is on functionality rather than specific thermostats. The code needs to focus on functionality because we could see additional thermostats coming to market.
            ii. Aaron: NEST doesn't like to share data/work with Xcel right now
           iii. Sean: This is on the commercial side and you do see nest in some smaller commercial buildings you know, so it's, but it's probably it's less of a concern than it is on the residential side except for multifamily, which is of course a commercial building. Google has begun to play nicer with demand responsive programs and has continued to do so. I think they realized that that limitation is starting to hem them in and be a market disadvantage.

      b. Mark J: how will this be enforceable?
            i. Sean: thermostats have to show what they are capable of doing as part of their system documentation. These temperature adjustments have been aligned with Title 24. Basically, any thermostat that said that it was Title 24 compliant would just meet this requirement. That would be a shortcut to compliance and to enforcement in many cases. You're not going to limit it to only Title 24 compliant thermostats, so it would be a matter of in some cases checking the documentation for the thermostat or the specifications for any kind of building automation system that is handling the demand response itself.

      c. John Dutch: what's the availability of the of the product? How does Xcel energy or the utility company in general gain access to the thermostat itself?
            i. Sean: Once you actually sign up for it and you know it, it is a matter of just connecting the thermostat, make setting the thermostat up to listen to the signal that the utility is sending. Smart thermostats and simpler thermostats meet demand responsive functionality, and that broadens availability.

      d. Elizabeth: Xcel has a program where they give you a smart thermostat through AC rewards program. Aaron, am I understanding correctly that it's only three brands that will actually work with you to do the demand response? So even if I buy some other demand responsive thermostat, it would not work with that program?
            i. Aaron: Yeah, currently if you sign up for AC rewards, you are eligible for a free thermostat and it would be one of those three brands. And those three brands are the only ones that we do communicate with currently.
            ii. Sean: the Xcel program is going to need to broaden the equipment that it works with as it wants to broaden its program because if you're going to limit it to only a small number of smart thermostats, it's going to be inherent limitation to the program. Since it's based on the functionality, that's really all that they would be concerned about is making sure that the controls are capable of responding to this signal instead of the controls being capable and participating in the version of the demand response program that Xcel has today. Now, since we are talking about equipment lifespans of 15 years, it is just focused

on the capability so that it is possible in the future. Xcel's program might be limited to only certain thermostats over time, but this ensures that it's at least a possibility for buildings to participate in the future.

e.   Elizabeth: on the commercial side for larger buildings where when we talk about thermostatic controls, we're really talking about building automation systems. How does that work? Mark can you tell us more about how you, as a designer, would specify and deal with that?

    i.   Mark J: with the requirement being the capability, that's quite easy. Every building automation system is capable of an internet connection. It's capable – that I can document quite easily. Any building automation system worth its salt has the capability of external comms, but here are users that will absolutely snip that wire though.

f.   Elizabeth: Yes, I guess I see this as a nice low hanging fruit option for being more traditional commercial nonresidential buildings and then really messy for multifamily.

g.   Sean: Aaron, when was the last time Xcel's program interacted with Google on being able to use nest thermostats?

    i.   Aaron: I can find out.

h.   Courtney: Do we feel the proposal needs a certain exemption or modification to add?

    i.   Nathan: I'm of the opinion that this type of demand response control to me is more in the purview of the utility, not the building code. And I really worry about including this into the building code. Would rather see Xcel incentivize, and don't want to kill these incentives by adopting this requirement.

i.   Eric: I want to come back to the specific language of the proposal and suggest that the thermostats that could be considered essentially all of them, including the nest thermostats, do have the capability, which is what the code language says it just says that it should be capable of the following. It doesn't mean that it needs to be connected and perform these functions, which I think is part of the barrier that we're talking about with some of the nest thermostats. I want to make sure that we're not actually discussing something that is different from what the code language is actually proposing here.

j.   Courtney: grid flexibility is a key pillar within Denver's Net Zero Energy definition. Denver defines "Net Zero Energy" as a new building or home that is highly energy-efficient and fully powered by renewable energy. This means that new buildings and homes will be: (1) Highly Energy Efficient, (2) All-Electric, (3) Powered by Renewable Energy, and (4) Providers of Demand Flexibility for the Grid. Working together as a community rather than individual buildings.

k.   Elizabeth: the challenge might just be with the language – should be revised in a way that it's a utility-approved control, so that this can grow with additional options that come available. Right now, I could buy a device that meets this code, but not be able to opt into Xcel's program.

    i.   Sean: you would still be restricting to the controls that the utility is currently working with. While demand response programs right now are generally run by utilities, they're not always run by utilities. Other utilities have managed to solve the NEST problem because NEST thermostats are being used in demand response programs across the country.

    ii.   Elizabeth: I agree with the futureproofing, but we still have to make it fit within what we're working with and what's going to apply for the next three years. I think multifamily is our best opportunity here to have demand response. If we limit this to the thermostats that Xcel works with, that might make NEST play nicer.

l.   Courtney: straw poll – does everyone want to connect this code proposal to reference the approved program through Xcel

    i.   Elizabeth: I would, but just for multifamily. I don't think that needs to apply to non-multifamily

        ii.   Mark J: I'll put the two cents on for the non-multifamily stuff again and that is simply that from a capability standpoint probably can always cover that. What if you wanted to allow or require a communications protocol that actually works with Xcel similar to what you're talking about for multifamily, you would need to do that. Changing language to "dwelling units shall have" would be a clean code way to deal with it

    m.   Aaron: if it's not an eligible device when we do have a program, I worry about people installing bunch of equipment that won't be controllable by the utility

    n.   Courtney: if Xcel doesn't have a program for multifamily, it doesn't seem to make sense to tie into Xcel's program for everything multifamily. We can't predict what Xcel's program for multifamily will be, so we can't write that language for it

        i.   Antonio: I second that comment

    o.   Eric: since we're talking about the capability of the thermostatic controls, I'm not clear if there's an actual barrier or problem. We're not talking about the actual interconnection and implementation of the set point adjustments; we're just talking about the capability of the device.

    p.   Elizabeth: does Xcel currently have a commercial demand response program happening?

        i.   Aaron: just for cooling – the AC rewards program

    q.   Sean: when we're talking about standalone thermostats, should this be a C406 option that is limited to equipment that is compatible with Xcel's program?

        i.   Mark J: I would always support the C406 addition for incentives

    r.   Courtney: check for consensus

        i.   Aaron: I would agree with the C406 path as well

        ii.   Eric: I'm good with that

Action Items:

        iii.   Aaron find out when Xcel last spoke with Google about Nest participation in Xcel's program

        iv.   Sean incorporate proposal to C406 as a credit option

#69 Residential Grid Flexible Thermostat: Sean (NBI) on behalf of Denver

    a.   Proposal overview: it's fundamentally the same as proposal #32 for commercial grid flexible thermostats. The big difference here is that for the smaller equipment that you see in residential, there actually is a demand response standard that applies (this is not the case for larger equipment) AHRI, 1380 applies. It's created as a residential thermostat standard, so there's a little bit more specificity there but that's the only difference.

Discussion

    a.   John: my only real concern is end use. The buildings aren't the ones setting up on the final end with Xcel – it's the homeowner. Instead of mandating the installation of a demand responsive thermostat or control, can we just require that everyone install a CAT5 or CAT6 line to the thermostat location so that anything can be retrofitted later?

        i.   Sean: Most of the thermostats communicate wirelessly and don't actually communicate over a wire anyway, so I'm not sure that that would add a lot of value. But I see what you're getting at.

    b.   Robby: could we say in R403.1.1.1, a utility approved, or compatible thermostat shall be provided? As designers, it would make sense to understand what are compatible thermostats and to put those in at the beginning.

i. Elizabeth: this may be less critical to have in the R code than in multifamily. In multifamily rental type of situation if the right thermostats not there it's not going to get there ever. If I'm a renter and my thermostat works for it and all I have to do is go on to Xcel's website and click a box and I don't have to physically change out any equipment, we're highly more likely to get engagement.

c. Sean: I was looking at how to try to reference Xcel's program and noticed that it's not available for multifamily anyway. It says to qualify it must be a single-family home, duplex or triplex quadplex.

d. Courtney: are we okay moving this forward?

    i. John: Generally, I'm fine with it since the program itself is voluntary. As long as I can find product to stick in the homes, that isn't going to jump the cost of the thermostat by $100 or $200 and are readily available.

    ii. Nathan: I worry about this being an additional requirement that is not going to end up actually saving a lot of energy in the residential space because it's voluntary and is going to require the individual homeowner to sign up for it.

e. Sean: What do folks think about moving this over to R408 as a credit option and then concerns about tying to Xcel's program are eliminated?

    i. Elizabeth: I like that idea.

    ii. John: Adding it to a list of credit possibilities is more acceptable, I think.

    iii. Nathan: That works for me, I think that's a reasonable compromise

f. Courtney: it sounds like we have consensus on proposal 69 to incorporate this into R408

Action Items:

a. Sean: move proposal 69 into R408 as an additional credit option

#69B *Residential Grid Flexible Thermostat for DGC: Robbie (BuildTank/Noresco)*

a. Proposal overview: for DGC – residential grid flexible thermostat. The only difference is that it's a requirement versus being a credit option.

Discussion:

a. Christy: I'm just worried about people spending money on equipment that never work with Xcel's program. I'm advocating that they can only install something that is compatible with the current Xcel program.

b. Eric: I think we could use a more generic statement to say participation in the local utility's program or something like that. We wouldn't want to necessarily name Xcel specifically, but it would achieve the same thing.

    i. Courtney: Robby, please add language that requires a thermostat approved by the local utility's program.

c. Courtney: check for consensus on moving forward – any opposition?

    i. Group supportive of proposal moving forward with edits, as discussed

Action Items:

a. Robby/Noresco proposal moving forward with edits, as discussed

#70 *Residential Grid Flexible Water Heating: Sean (NBI) on behalf of Denver*

a. Proposal overview: this requires that storage, water heaters, electric storage, water heaters between 40 and 120 gallons have to comply with CTA 2045, which is the demand response protocol that is available for storage water heaters. There are a couple of key exceptions: high temperature systems, since they're typically associated with process loads, and

exceptions two and three are the same thing -associated with process loads. Exception four relates to two additions of CTA 2045. One of them is a more robust set of demand response and that's level 2, level 1 is just load shedding. This exception allows for equipment that is available on the market now to meet the requirement. This is a capability requirement – the standard specifies functionality, not participation.

Discussion

a. Mark J: we should make sure to coordinate with the electrification proposal as well. What's the intent and how does it relate to the heat pump type water heaters?
   i. Sean: That, is probably a fairly key consideration. Historically, these have been provided for electric resistance water heaters. Currently the manufacturers are only implementing it on heat pump water heaters that could change in the future as we're beginning to see these requirements adopted in places, they may then realize it makes sense to put these controls on electric resistance again, but right now all of the water heaters that comply with this are heat pump water heaters.
b. Sean: I think this is the one that we want to see in commercial too, where it just specifies level one because that's what's available right now and the level 2 stuff will be coming on the market after Denver's code transitions again, so you might as well just wait to specify level 2 when that equipment is on the market. Anything that means level 2 meets level one, so it's not a big deal. And this is just simpler and easier to read and easier to enforce. This does still have those same service type water heater exceptions that you might occasionally see in R3 and R4, but you would more often see in commercial.
c. Courtney: do we want this to be standalone in the base code – a requirement for the base code or do we want it to move into the prescriptive path?
   i. Mark J: the scope on this one is limited, so I think this would be suited for the base code and not an option for the prescriptive path
b. Christy: would love to add the language that requires it to be compatible with the current Xcel program
   i. Sean: I don't think it's necessary because DR communication for water heating is only 2045 – that's the only one for this type of water heater. This is the one that they would use
c. Courtney: Aaron, does that sound good to you?
   i. Aaron: yep
d. Courtney: check to confirm group is supportive of moving this proposal as written
   i. No opposition for moving this proposal forward as written

Action Items:

a. Sean move proposal forward

#38 Commercial Grid Flexible Water Heating: Sean (NBI) on behalf of Denver

Discussion:

1. Courtney: Sean, is proposal exactly the same language as proposal 70 but just for commercial?
   a. Sean: it's exactly the same language except it has the commercial numbering and has the commercial table for modeling
2. Courtney: does every agree with moving the commercial provision forward based on the support for the nearly identical residential proposal?

3. Aaron: we do not have a current program for the commercial side
    a. Courtney: does that deter anyone from wanting to move this forward?
    b. Christy: if the technology will be compatible when a program comes online, then why not?
        i. Group supportive of moving proposal forward

Action Items:
Sean move proposal forward for residential and commercial since it's the same language