

Commercial Energy Modeling Working Group

Meeting #4

June 22, 2022

11a.m-12p.m.

Introductions:

1. CPD: Antonio Navarra
2. CASR: Katrina Managan, Courtney Anderson, Tom Gleason
3. Attendees: Taylor Roberts (Group14) Elizabeth Gillmor (Energetics), Sean Denniston (NBI)

Review and Discuss Proposals:

1. pEUI
 - a. Proposal Overview: This proposal provides a pEUI for certain occupancy types. Sean added Energize Denver language to recognize Energize Denver exists. Similar to site energy where it creates an appendix and C407 would reference the appendix. pEUIs are derived from Energize Denver and prototype buildings and then 10% better than Energize Denver or prototype buildings, whichever was more stringent.
2. Modeling Protocols
 - a. Overview: This is based on modeling rules and procedures NBI developed for Boulder – takes next step forward and learn lessons from Boulder and other places. It goes through both Appendix G and how to modify Appendix G modeling to a target. This lives outside of the code for a reason, modeling to targets is really the very leading edge of modeling code compliance, and so we want to make sure that the rules for doing that are more easily changed and modified to respond to the conditions in the market. Schedules and load density tables function as a minimum. The tables in the guide set a floor for a building asset to make sure buildings are capable of a kind of minimum efficiency at a minimum level of usage. You can make it more dense, but not less. You can have higher plug load densities, but not less. High altitude de-rating for gas equipment added in. If you have code-level efficiency equipment you have to de-rate the efficiency in your model for EUI.
3. #18 Appendix G
 - a. Proposal Overview: We tried to simply primary approach to Appendix G as much as possible. Move site energy components to a separate appendix – free standing path to not clutter up the main path through appendix G. Adjusted the definition of an all-electric property – so you can still qualify as all-electric when building has emergency power systems and standby power systems that could be powered by combustion sources and we use the definitions that are already in the building and fire code. Two connections/references to Energize Denver will force design teams to confront the EUI that will be relevant for this building. It will make sure that it is obvious to the design team all the documentation will have it, so it'll be available to the owners as well. For all-electric properties, these are the standard BPFs from 2019 when calculated under the

new methodology. For all other buildings, that's when we apply that old Denver target adjustment to the BPF alone. We're not applying it to unregulated loads, the BPF only applies to regulated loads, so we're only moving that portion of the building consumption. They're almost all lower. Restaurant and warehouse are the only two that got tighter, and in the case of restaurant, this is only for the regulated loads and all those cooking loads are not regulated loads.

Summary of Topics Discussed

1. pEUI for Parking Garages
2. Modeling Protocols
3. Appendix G

Detailed Notes

1. *pEUI for Parking Garages*

- a. Elizabeth: if we have a project with a parking garage would that get lumped into an office or hotel or is that separate?
 - Taylor: I don't know if we directly address it. Boulder's direction has always been, you have to add the energy use of the parking garage, but you don't get anything for that. I don't know if we directly call that out in here, so that could be a note to clarify.
 - Katrina: parking can always be subtracted if it's sub-metered. If it's not sub-metered, you can make an adjustment based on square footage
 - Elizabeth/Taylor: need to consider parking garages – especially if they're conditioned. Don't want to make a blanket exception for all parking. Recommend a line item – so there's a target for parking garages
 - Sean: most/all the prototypes don't include the garage.
 - Katrina shared EUI's Energize Denver is considering for parking garages (EUI 3-11)
- b. Sean: Would using Energize Denver target for open garages, the 3 EUI and a weighted average work to encourage open garages over partially/completely enclosed garages
 - Taylor: I was also thinking 3 EUI – that could be a good starting place
- c. Elizabeth: I would prefer not to pretend that the garage is not there
- d. Katrina: okay so structured parking will have a modeled performance target of 3?
 - Group: yes
 - Sean: And we'll need to check the appropriate code term for that.

2. *Modeling Protocols*

- a. Elizabeth: where did these modeling protocol numbers for pools come from? Are they based on any particular design conditions?
 - Sharon: there is a 15 page technical guidance manual that explains exactly how they got to this small little chart and I can't share the details with you on this call, but I can give you the link to the document if you want to look at it in more detail:
https://www.energystar.gov/sites/default/files/tools/Swimming_Pool_August_2018_508.pdf
- b. Taylor: recommend adjusting the proposed building performance of HVAC systems (No. 10) language to “a rated efficiency within 10% of the requirements of tables...” instead

of 5%

- Elizabeth: that makes sense.
 - Number was updated.
- c. Elizabeth: recommend noting/highlighting if the software is doing altitude adjustment for you as opposed to manually entering the adjustments
- Taylor: I think we could add something in there
 - Sean: I think that that's a fairly straightforward. Documentation shall be provided of method, whether it's in software or manually. And we can add that language fairly easily.
- d. Taylor: recommend updating the MF building schedule for plug loads it's like 3 times that of LEED, which references Energy Star. If this is the baseline, that baseline is off. Schedule is 5840 full load hours where the Energy Star schedule is 2117. It might make sense to just put in the Energy Star schedule
- Elizabeth: agree
 - Sean: I think that's reasonable if you find these schedules closer to reality
 - Taylor to send Sean schedules

3. Appendix G

- a. Elizabeth: will small gas uses like fireplaces or gas stoves cause a building not to count as all-electric?
- Sean: it's not just about the loads but it's also about the hookup because gas loads can grow. Buildings that want to keep a few gas loads would need to go through the mixed fuel path prescriptively. Getting rid of HVAC and water heating loads allows you to get through that path far more easily. Both the site energy and target energy modeling paths also incentivize moving from gas to electric.
- b. Elizabeth: if the goal is truly to not have a gas hook up to the site for new construction, I think you're going to have to say that
- Sean – add “or connection to gas utility” to definition of all-electric property to Section C202
 - Antonio: love it
 - Elizabeth: that's the key
- c. Taylor: Real quick, just to clarify those BPF have the Denver adjustment, so there's no other adjustment, we just use those BPF?
- Sean: If you're all electric, you just use that one. Those are straight 2019 numbers. You don't have to use a different equation and that was really the purpose of this - to make to make as few modifications to Appendix G as possible to meet Denver's goal. We really wanted to simplify it and streamline it. We understand some practitioners are going to be adjusting to Appendix G and to the new Denver code at the same time, so we want to minimize the number of things they have to adjust to.
- d. Elizabeth: Taylor have you plugged this for your projects to make sure that we're on track with goals?
- Taylor: I plugged in cost. I haven't done site because our calculator doesn't do it automatically for me, so I have to do it I. My gut check is that an all-electric building will hit the site quite easy honestly. If they really go all-electric, they should be able to hit these. If they're mixed it's going to get harder. And then if

they're gas, they'll probably go straight Appendix G and wouldn't go this route at all would be my assumption.

- e. Katrina: gut check – Elizabeth do you have any additional questions or concerns?
 - Elizabeth: my first gut reaction is that this feels good. I do want to do a little due diligence and make sure that there is a pathway for all projects. I agree with you Taylor, I think this is that this is that these are definitely achievable. I also still want to make sure that if I have that project that it is still more attractive to be mostly electric than to switch to gas. Even mostly electric is going in the right direction
 - Taylor: I feel really good about the EUI pathway. Site energy addresses some of those issues that have been in C407 a long time
- f. Elizabeth: one last thing to consider - a fall back option if the required solar cannot fit on-site. What to do with high energy projects that are doing everything they can but cannot physically fit the required solar? Review and reconsider solar percentage cap for both reference model paths – that should be discussed and how does this align across all paths.
 - Sean: there's no required minimum for commercial. 90.1 does have a cap on the renewables that you can use towards compliance which is a 5% cap.
 - Taylor: does the city have a strong opinion? If not, my vote would be to just get rid of it
 - Taylor/Elizabeth: recommend 10% solar percentage cap
- g. Elizabeth: I think the draft is ready to share and Taylor and I can share some results with the full committee.
 - Taylor to review and vet proposal by the end of this week
- h. Taylor: having these 3 paths gives us some really good options and I feel much better getting rid of the multiplier
- i. Elizabeth: I think the general concept feels really good and that's the important part and I agree with Taylor, having these 3 paths gives us really good options and I'm glad we got rid of the multiplier

4. Other Topics Discussed

- a. Next Steps
 - This proposal is scheduled to be heard on July 7th by the full committee. We will aim to send draft proposal to the committee this week

Meeting adjourned