

DGC Committee Hearing Meeting Minutes # 6

May 5, 2022

2 p.m. – 5 p.m.

City and County of Denver

1. Roll Call and Introductions: 11/18 voting members, Quorum Achieved. (Quorum is 10)
(Majority Vote = $\frac{1}{2} + 1=7$), as of 4pm, 10 members, 6 is majority.

Name of Committee Member		In Attendance?
Cheryl Hoffman		
Christy Collins		X
Courtney Anderson		X
Don Larsen	Non-Voting	
Eric Browning		X
Daniel Krausz		X
Josh Radoff		X
Paul Hutton	Non-Voting	
Adam Meltzer		X
Chris Gorham		Cannot attend
Travis Hendrix		X, arrived at 2:40
Tom Hootman		Cannot attend
Eric Entlich		Arrive late, leaving early
Jonathan Fertig		X
Jeff Tejral	Non-Voting	
Austin Krcmarik		X
Renee Azerbegi		Cannot attend
Darcie O’Conner Chinnis		X, Leaving at 4
Keith Fox		X
Scott Rank		Cannot attend
Stephen Sanderson	Non-Voting	
Antonio Navarra		

2. Discussion and voting on **DGC**

- a. **#P8.3 901.3.2.1 Embodied Carbon Emissions of concrete materials**

Summary: Webly Bowles from NBI, proposal outlines GWP limits for concrete

mixes. Emissions from building materials will become more common as codes address operational carbon. Concrete and steel account for 50% of emissions for materials for new construction projects. 50% of concrete suppliers in CO can currently meet this criterion as written. Threshold values are based on 50% of national values, allowing for a wider range of allowable mix designs. Environmental Product Declarations (EPD) will continue to grow so more and more producers will be able to comply. Thresholds are aligned with Buy Clean Colorado. When presented to IBC committee, cement and concrete industry members of the public supported this and explained that internally as an industry they are working toward this goal.

□ Public Questions/Comments

- Support: Rebecca Esau from RMI and support the adoption of this proposal. This language is comparable to the Buy Clean ordinance being heard at Division of The State Architect, for state projects. Some manufactures will need to adjust mix design. This code does not suggest that suppliers/ manufacturer would need to use emerging technologies. Industry is on board to disclose GWP. RMI/Skanska report from 2021 showed a concrete mix at within 1% of cost to typical concrete.

□ Committee Questions/Comments:

- Christy: Talk about potential costs for little to no additional cost to projects. Weibly responded it can be additional cost for manufacturers to provide EPDS, but there may even be a cost savings (less cement) at project level or up to a 1% cost increase. At the producer level cost increase is distributed over multiple projects and is typically an initial first cost.
- Josh: Does this differentiate between operational (production) or material embodied carbon? Considering the embodied carbon does consider local grid emissions. Cleaner grid will have lower GWP content. Concrete is not necessarily dominated by the energy used to produce the product. Weibly states that the language allows multiple

ways to comply, i.e. carbon capture (CarbonCure) or adjusting mix design to reduce cement content. This doesn't limit the amount of CO2 or concrete quantity per project like IFLI, but is a materials based requirements to be more flexible.

- Daniel: Is this on the manufacturing side? Would limiting/ regulated manufacturing side solve the problem. Webly said Yes, you should likely regulate it from both angles- manufacturing and procurement. Policy from the manufacture side would take longer, so currently codes have addressed design parameters.
- Josh: From the development industry, there is a huge need to create a demand signal to make the industry react. Regulation would likely not happen unless there is a market for this. Becomes much easier to regulate supply once the demand is there.
- Daniel: DGC will trigger demand, as well as state with Buy Clean Colorado.

Motion Passes: Motion to approve as written: Josh, Adam to second (9 votes yes, 1 vote no, 0 abstained)

b. [#P8.4](#) **901.3.2.2 Embodied CO2e of steel materials**

- Summary: Webly Bowles from NBI: This proposal is made up of two components: EPD provided for 75% for structural steel by weight or cost. 75% lower carbon steel by EAF or in renewable energy grid area. Several steel mills in CO. Biggest driver: the energy used during production. Steel mills to buy renewable energy to offset energy. Encourage American made products that use EAF (Electric). Can be met with little to no project cost increase. Many manufacturers can already meet this code as written.
- Public Questions/Comments:
 - Rebecca Esau from RMI: Support adoption of proposal. Buy Clean includes structural steel and reinforcing bar. Like concrete, there are tried and true ways to reduce GWP for steel manufacturing. Reducing

carbon emissions before the building is built is important. This proposal aligns with the current carbon reduction goals.

□ Committee Questions/Comments:

- Jonathan: Are steel angles or channels are not included, correct? Was this intentional? Webly said they are going after larger pieces of steel. Concern over tracking small pieces of steel for fabrication, etc. Could be expanded to include those types of steel in the future.
- Josh: Recycled steel tend to use EAF. BOF steel is much higher in emissions. Most steel made in US would fall into this limit, because it is EAF. Is there more nuisance to the limits? How much of what we buy in the US need to come down further than it already is? Webly says that intent is not to eliminate any type of steel milling process, as BOF could offset with different energy sources like hydrogen. Would these limits allow any BOF steel (without hydrogen) or just EAF steel? Maybe not any BOF furnaces in the US- higher carbon content because of fossil fuel and less recycled content without allowing offsets. Would all recycled steel comply? Webly gave an example of lower embodied carbon with rebar because it tends to be made with 90-95% recycled content. How much of the steel in the US is recycled? High recycled content and EAF are correlated.
- Jonathan: Is transportation included in these values? How can we encourage steel shipped from China? The carbon within an EPD include A1-A3 for the product which includes harvesting, transport and manufacturing within the product stage, so there are some transportation emissions in this. A4 emissions are from transportation to the project, which adds an added layer of complexity but could be added later.
- Josh: Initially concerned with renewable energy listings for 5 options for different ways to offset with renewables. Webly said they are not currently in IGCC 2021 but will be in next version. All definitions provided in the proposal have been approved in I codes. Webly said they are also in zero code.

- Daniel: Rebecca mentioned the broader impact for steel beyond just buildings? There has shown a ripple effect in Europe, where automakers have been buying low and zero carbon steel. This shows how the positive impact and increasing demand from other industry of steel purchasers. Infrastructure can also be affected.
- Adam: Concerned about the financial renewable energy agreements and buying your way out of GHGs. Cost of REC/COs are so high right now, what is the impact of removing the buy-your-way-out option? Renewable procurement provides an alternative. If the limit can't be met, then they will not comply. High users of energy, allows for transition for a green hydrogen future and supporting renewable industry. Maintains concern steel manufacturers will just buy their way out of it.
- Josh: Scope 1 (emissions from fuels use, vehicles, occur from sources owned or controlled by an organization) or 2 emissions? Scope 2 (indirect GHG emissions from purchase of electricity, power) is appropriate. Can you use offsite renewables to offset Scope 1 emissions? Webly said currently EPD don't include offset renewable energy. Very technical but dependent on PCR (product category rule) for EPD production. Allows the community benefit for more renewable, applied to code and wouldn't be double counted. Could high GWP steel that is offset with renewables comply with this? Yes. Emphasized that he wants to eliminate steel from a BOF unless they have onsite generation. Not less than 50% for offsets.
- Daniel: He wouldn't have an issue removing financial offsets. Want industry to change. This is an elective code. Don't want a project to buy themselves out of it. If projects are opting for this path, they should be onboard with purchasing low carbon steel and working with the supply chain.
- Josh: If we remove option #3, does that give preference to cleaner grid where the steel mill is located and not about the industry itself? Can we adjust EPDs to address scope 1 emissions? We don't want

BOF steel mills to just buy their way out of this.

- Adam: Middle ground for financial support. Wants to reduce from 50% to 25% to deter steel manufacturers from buying their way out of it.
- Daniel: Reminder to the group, regulating this on the designer/contractor/ inspection side, so it needs to be enforceable. Let's try to keep this simple, difficult for multiple options for code compliance.
- Travis: Understand the idea, see where Adam is coming from but demand and supply, escalation of costs for materials right now causes supply chain issues. Industry can't just pivot on dime, but we need to have options. Don't know why we are trying to make it harder to comply by limiting compliance options, especially for smaller projects.
- Webly: Address Josh's question: modify an EPD (third party verified), can't change the EPD process and scope emissions. That would be overly complicated.
- Josh: Is this offsite language consistent with the state? Webly said no it is not 100% consistent.
- Daniel: are the 5 requirements in option 3 also third-party certification? Webly said Option 3 is not part of EPDs, from the manufacture to the design team. How would this even work? Is it for a particular time frame? Confused on how this would be verified by the AHJ. Use the contract for renewables for verification. Timing would need to be aligned on when steel was produced.
- Courtney: Wants to hear from Webly if this is still workable/functional if part 3 is removed. This allows only one path for compliance but it still viable.
- Josh: Doesn't feel limiting. Doesn't seem to be too far of a stretch.

□ **Motion fails: Motion to Modify to strike 2 and 3, not related to EPDs: Josh (3 votes yes, 6 vote no, 2 abstained), Daniel second**

□ **Motion Passes: Motion to Approve as written on screen: Courtney (8 votes yes, 2 vote no, 1 abstained), Jonathan to second**

c. [#79c](#) - 801.3.9 Expanded Indoor Environmental Quality: Low-VOC materials to match Ft Collins

- Summary – Low VOC adjustment. Also heard in IRC and IBC. Did not pass in IBC. Making sure what was not approved in IBC remains in DGC. Insulation, furniture, and composite wood. Aligns two codes and backfill what wasn't approved in IBC.
- Public Questions/Comments: None
- Committee Questions/Comments:
 - Eric: would be a matter of a general statement that includes residential.
 - Daniel: is this as written in the current DGC. Kristen said there are a few minor modifications, feedback from other committees to allow for additional standards related back to these materials to look for Greenguard and CDPH Standards.
 - Jonathan: PDF posted is different from this. Can you send revised PDF? Kevin said yes but isn't sure which one is most current. We can table it if needed. Kristen said only information updated is Greenguard availability. Deleted out redundant language to streamline for reduced confusion.
 - Adam: Addition of Greenguard, is that directly related to VOC emissions and other standards in other categories, eg. Floor score in flooring, SCAQMD, etc. Kristen, Greenguard only applies to CDPH testing. VOC content, and how it's tested. GG Gold covers testing methodology. Floor Score and CRI label is different. Since those categories were approved in IRC but not IBC, we need to clarify here. Adam: do you want to say total VOC (TVOC) limits? Kristen, yes.
 - Jonathan: Reference to elective? Why is that there? Kristen said we will wait to determine this until the end. We had recommendation in our original language. Eric: we'll capture this later in the process.
 - Adam: will you add the 3rd party that align with testing? There are many. Kristen said the intention was to leave them out. See the potential issue however they are using same testing in CDPH, Floor

Score and CRI.

- Daniel: this does not appear to match the current code. What is new that would be underlined. Kristen said this matches what was adopted in IRC. Idea was to move this to base code and then backfill here. If this doesn't get passed, then we will revert back to what is written in DGC.
- Jonathan: does this only cover indoor, nothing exterior. Was there thought to including everything. Kristen said she's open to including it.
- Adam: it's not typically addressed because it gets diluted outside. So less of a concern. Although agree it's destructive. Motion to amend to add or equivalent in last sentence, first paragraph.
- **Motion Passes : Motion to Modify with "or equivalent" in last sentence, first paragraph: Adam (11 votes yes, 0 vote no, 0 abstained) Eric to Second.**
 - Eric: what are you proposing to add? Adam said there are a lot of certifications that fall under TVOCs that could be included.
- **Motion Passes: Motion to Approve as written on screen: Adam, (11 votes yes, 0 vote no, 0 abstained), Eric to second**

d. [#85a](#) - IEQ Maintenance and Monitoring

- Summary: Pulled from IGCC 2021 and adjusted for Denver. Operational plans for IAQ plans for PM2.5 and ozone.
 - Committee Questions/Comments:
 - Jonathan: All of Denver is in the nonattainment area for PM2.5. Kyra says that MERV 13 is the min level of Section 801.3.1.3.
 - Eric: Section 1001.1b section to be calendar range. Recommends striking date range.
 - **Motion Passes: Motion to Modify to delete date range, being in effect all year round: Eric (9 votes yes, 1 vote no, 0 abstained), Adam second**
 - **Motion Passes: Motion to Approve as written on screen: Eric, (9 votes yes, 0 vote no, 1 abstained), Christy to second**

e. [#85b](#) - 1001.X IEQ Assurance and Occupancy Awareness

- Summary: Follows 85A, ignore project elective, requires survey for occupancy. Satisfaction for overall IEQ. Remediation requirements and promote awareness and have results available to occupants.

□ Committee Questions/Comments:

- Daniel: 1001.x.2 What is being measured in b.2.?
- Adam: Lean on code section skills to c1 and c2.- can we word this better? And include response rate? Address this information from ASHRAE 55 within code itself. Kyra agrees adding these directly will be easier for reader.
- Eric: 1001.x.1a could take much longer to fully occupy building outside of the 6-18 months. Can we be more explicit and instead say 80% building occupancy? Or pivot to tenant space itself? Thoughts to consider... Kyra open to modification. 6-18 months post 75%-80% occupancy.
- Kyra: 1001.x.2 What is being measured in b.2. is ozone and PM2.5. Can we reference back to 1001.4 are the parameters measured? As these were once one proposal and then were separated.
- Christy: Is it clear where the remediation is trigger? Kyra recommends pulling in EPA limits into the proposal.
- Daniel: 1001.X.1 change c. from plan to actual a report of the survey results. Also change c4. Change "will" to "shall". Include actual standard (PM2.5, Ozone, air quality (1001.x.2 b3)) language is written in the proposal and not referenced.
- Kyra: addressing 1001.x.2 b3, Qualitative results is about Data visualization of survey results- about graphics, pulled from WELL building standard.
- Travis: This would be challenging on the residential, like it as elective. Don't see the intent of the displays of results. Friendly suggestion to remove signage from the awareness language.

- Daniel: Passing the intent to split these two efforts and two separate measures, survey and making improvements from awareness piece.
 - Eric: 1001.x.1: friendly suggestion to replace issuance of certificate of occupancy to 80% of occupancy. Daniel recommends finding a better % as some building types stay 20% unoccupied (rental MF apartments). Eric wants it to be high enough to be impactful.
 - Travis: How are we calculating the occupancy? Can be difficult in MF? Would like to adjust 1001.x.2 a1. to make it more practical. Seems like overkill. Friendly change to striking display screen in a publicly shared space. Daniel confirms and adjusts language.
 - Eric: Consider multitenant spaces and include tenant suite. Consider restricted space and visibility. To serve the intended purpose. Daniel would add or tenant space, for high visibility of information for those buildings without a lobby. What about a building with a lobby but 60 suites? Eric said one display screen is not enough.
 - Daniel: Modify to include publicly shared space on each story or within each tenant space.
 - Christy: Consider building types, university, or school. Occupied? Something applied to the whole building wouldn't be relevant.
 - Daniel: Depending on 1001, collected per space would be collecting data. May have missed a layer of complexity here.
 - Kyra: Could add other indoor pollutants to the messaging in the future?
 - Christy: If MF, unit by unit vs whole building scale? Change applicability? Some instances where it will be illogical.
 - Daniel: It would be beneficial for this to be tailored to MF. Additional change to 1001.x: 80% of intended occupancy goals.
 - Eric: Reinforce that this is a good start for the DGC.
- Motion Passes: Motion to Modify as written on screen: Daniel (10 votes yes, 0 vote no, 0 abstained) Second Travis**
- Motion Passes: 10/10 To approve last proposals if we lose quorum.**

- f. [#67b](#) - 601.3.1.2.2 Automatic Irrigation Controls
- Summary: Most language is already in DGC. Instead of *where* you use controller on irrigation, you *must* use a smart a controller.
 - **Motion Passes: Motion to Approve as written on screen: Eric (10 votes yes, 0 vote no, 0 abstained), Daniel to second**
- g. [#32](#) - 501.3.3.6 Established Tree Preservation
- Summary: Extends tree preservation to private property. Defines what an established tree is, with notes on canopy interfering with construction. Update: This proposal was voted on in DGC Code Hearing #1 and went to committee for updating and verifying language. We are approving the updates coming back from committee, highlighted in yellow.
 - Committee Questions/Comments:
 - Adam: Did we vote on this already? Christy said this is an updated document.
 - Eric: Make sure it's clear that while we are voting on green code provisions, there are other agencies with regulatory authority over trees. Must coordinate with them to ensure they approve as well. DOTI, Parks and Forestry.
 - Jonathan: Are we okay to miss out on housing because of a tree, e.g. 5 homes or 10 homes. Daniel: Trunk of tree is in setback, canopy is limited typically in size. Did think of this, so added exception. Daniel said that a certified arborist can trim the tree up to 1/3. Usually, can save the tree and trim to make it work.
 - Travis: Did we talk about tree replacement with similar caliper? In other codes. Could make this happen in a more meaningful manner. Did we talk about this? Daniel said it's not in here to replace. Not equivalent to replace older tree with younger tree. Done in Boulder County. Also allows consideration of health of tree. If a tree is in north setback and build a house blocking the light, will damage tree. Seems feasible and positive outcome.
 - Kristen: Also have several requirements for number of trees in

landscape proposal heard in first hearing.

- Adam: Although good idea, adds layer of complexity that I don't think is needed here.
 - Christy: This proposal isn't about quantity of trees. Specifically, about older established trees. Character, biodiversity, ecosystem within tree. Keeping healthy established trees in place.
 - Daniel: City Forester incorporates replacement on all projects. Gets detailed because of what replacement looks like, what is replaced with.
 - Travis: Goes back to other agencies, acting in good faith that this is happening. Want to make sure it's included in discussion.
- Motion: Motion to Approve as written on screen: Daniel, (10 votes yes, 0 vote no, 0 abstained), Eric to second**