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**C-TRAC****Meeting # 6**

**Topic: IgCC Chapter 6 - Energy Efficiency**

**Wednesday July 21, 2010, 3 – 5:30 pm**

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**PARTICIPANTS IN ATTENDANCE****Utilities Green Building Team**

Amanda Sutton – Green Building Program Coordinator

Felix Lee – Green Building Code Project Manager

Gary Schroeder – Energy Services Engineer – Commercial GB Code Review

**Facilitator**

Susanne Durkin-Schindler

**C-TRAC Members**

<b>Company</b>	<b>Representative</b>
Beaudin-Ganze Consulting Engineers	Corey Rhodes
Brinkman Partners	Josh Guernsey
Institute for the Built Environment	Josie Plaut
Nolte & Associates	Jeff Giles
Starwood Construction Mgmt	Sandy Willison
Greg D. Fisher, Architect	Greg Fisher
Trane / IFMA	Matt Horner
PSD	Pete Hall
Bella Energy	Rick Coen

**Building Officials**

City of Fort Collins	Russell Hovland
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***Key Points:******City Council Work Session Summary - Gary Schroeder & Felix Lee***

On July 13, 2010, City Council held a Work Session to discuss an update on the development of the Green Building Program. All Council Members were

present. Staff members making presentations and answering questions were Utilities staff Patty Bigner, Doug Swartz, John Phelan, and Felix Lee.

There was extensive discussion and many clarification questions regarding the Green Building Program. Each Councilmember provided their individual perspective and feedback. Council supports moving ahead with the approach proposed by Staff, with the exception of timeline. Major points of discussion were:

**Integrated framework.** Council supports the market transformation approach of the Green Building Program, balancing voluntary, market-driven, above-code elements to “pull” the top end of the market while a green building code “pushes” the bottom end.

**Green building code.** Council supports integrating mandatory green building practices into existing City regulations rather than establishing a standalone green building code. Council Members have varying perspectives on the scope of the green building code enhancements and degree of push they provide.

**Costs and benefits.** Council would like to see a costs and benefits analysis of the proposed green building code enhancements. The costs and benefits should be considered from a Triple Bottom Line perspective.

**Resources.** Council needs more specific information about the proposed elements of the Green Building Program, with estimated resource needs, before they can address resource availability. Additional resource requests should come through the Budgeting for Outcomes process.

**Timeline.** Council would like another Work Session on this topic in late 2010 and a final green building code proposal for consideration no later than the end of February 2011.

### **Next Steps**

- Continue development of Green Building Program, continuing quarterly progress reports.
- Green Building Program update at Work Session on December 14, 2010.
- City Council consideration of the adoption of green building code enhancements, First and Second Readings completed, first quarter 2011.

### **Additional Updates:**

Staff initially had support from both TRACs when the proposed direction was presented prior to the Council Work Session. However, when staff presented the results of the Council Work Session to the R-TRAC at the July 14<sup>th</sup> meeting, some of the R-TRAC members voiced concerns about the proposal. There was strong agreement for adopting the NGBS as the Green

Building (GB) code which goes against what was presented to Council. Staff is working to resolve this issue and find an appropriate solution.

The C-TRAC continues to be on track with the code development process that was previously outlined. Staff has developed a spreadsheet to track the progress made by the C-TRAC and the GB practices that the committee thinks should be adopted as mandatory amendments to existing codes. At the end of the process the committee will revisit the proposed amendments and determine if modifications or additions need to be made. The goal is to have a limited number of amendments (10-20) that will have the greatest impacts.

As we go through to develop the code we need to focus on items that are high-value and have low/medium initial costs. This can include items that help bridge gaps in existing code. Staff may go through and pick items to discuss during meetings but if committee members have anything else to add please do not hesitate to speak up.

### **Committee Comments:**

- The GB code is a good opportunity for the City to tackle some of the problems and disconnects in the building industry. Currently, a developer may build a building as quick and cheap as possible so they can turn around and sell it. They are not concerned with the energy use of the building or the lifecycle analysis of the materials. This is where the code could bridge the gap so builders would be encouraged or prevented from doing that.
- Need to define "high-value." Is that only looking at financial or is the triple bottom line considered in that assessment?
  - Financial implications are important but we will be looking at the whole picture which includes the triple bottom line of people, planet, and economy.
- Council gave us the opportunity to have the flexibility to use language from other standards and codes for the Fort Collins green building code. We are no longer limited to using the IgCC as the only source for ideas.
- Need to make sure the GB code appendix references back to the existing I-code sections that are impacted. The code needs to be easy for builder's to use and understand.

### **607.10 - Control of HVAC in Hotel/Motel Guest Rooms**

The intent of this section is to reduce HVAC energy use in guest rooms during unoccupied periods. This section is also referenced in more detail in ASHRAE 189.1 and includes other sources of energy use such as lighting and appliances.

**Committee Comments:**

- Occupant comfort is important. We do not want to make people uncomfortable when they are paying to stay in a room.
  - Guests would have control of the conditions in the room when they are there.
- This is something that has been implemented with success in areas of Europe and Asia and is starting to be more common in the industry in the U.S. because hospitality owners are seeing big savings from this type of system.
- This may require a cultural shift and customer education.
- In Asia, these types of systems work by having the room key complete the electrical circuit for the room. All systems shut down when the key is removed and turn back on when the key is replaced.
- Hotel staff may already be turning off lights and adjusting temperature when they come in to clean the room. The existing practices of a hotel will impact the payback time of the system.
- Occupancy sensors can be used to do what you need them to do, but may not be the best choice for this application. They would need to be very sensitive or have infrared sensors.
- Cost increases will depend on the system and equipment used. The existing air cooling equipment may not be able to be tied into certain types of systems. If a hotel has to replace all the air cooling units to use this system it may increase costs.
- If we only have a limited number of amendments to the code - is this something that we want include? Hotel/motel construction has slowed down due to the economy. Is this something that could wait until more of these types of buildings are being developed in Fort Collins?

This item will be put on the "tentative" list and staff will work on getting more data. Additional data is needed on the types of systems available and the capital costs and payback time associated with implementing this technology.

**Renewable Energy:**

There are several sections in the IgCC that talk about the development of renewable energy systems. ASHRAE 189.1 has a renewable energy requirement as well. Staff thinks that this might be something that is important to include in the GB code.

The question for the committee: Should some percentage of on-site renewable energy be required on all new construction?

### **Committee Comments**

Two major aspects of renewable energy systems that were discussed by the committee: Solar-ready construction and on-site renewable energy requirements for new construction.

#### ***Solar-ready Construction:***

This would require new buildings to be designed so that they could install a solar system at some time after the initial construction has been completed.

- The problem with "solar ready construction" is that it does not always work with every solar electric system out there. This is easier for solar thermal technology.
- Could simplify this issue by saying that you need to design with enough room for the solar components (e.g. place mechanical equipment on roof so there is space for solar, leave space in mechanical room for a storage tank, space in electrical room for an inverter). Design roof so that structurally it will handle the load of adding panels in the future. Don't want to prevent owners from installing solar in the future.
- Technology is adapting quickly. It may not make sense to require buildings to be solar-ready for technologies that may be obsolete in 5 years.
- Instead of saying that a building should be "solar-ready" maybe we should say that it is "solar tolerable". Buildings should not be designed so that solar is not an option (having plenty of roof space and structural components to support solar panels).
- It doesn't seem logical to make a builder or building owner spend the money to prepare the building for something that may not ever happen.
- The amount of structural support needed would depend on the type of solar technology used.
- The panels themselves are usually not the problem; it is when snow drifts are added that the weight of the system is an issue.
- When thinking about "solar ready" would that include only the things that cannot be changed affordably after the building is built? That may be a better way to think about for requirements.

- If the City does not mandate renewable energy at some level it is very unlikely that it is going to happen, even if a building is required to be built "solar-ready."
- The highest priorities for "solar-ready" design are roof structure and space availability. The pathways for wiring and equipment are secondary.
- There are issues with fire-rated shafts. So just requiring a chase in which to run pipes or wiring may be difficult to implement.

### ***Renewable Energy Requirements:***

This would require that all new construction to have some percentage of renewable energy included on-site to offset the energy use of the building.

- It would make more sense to require something that is more specific like solar hot water. That system is less expensive and has a large payback.
- There is a lot of feedback from the community that solar electric systems are very high cost and the payback time is too slow to make these projects feasible.
- Requiring roof mounted panels would also increase costs due to the need to increase the structure and weight load that the roof can handle.
- This is something that is highly location dependant. It would be difficult to make solar power a requirement.
- This requirement could be difficult for people who are doing remodels and alterations to implement.
- Need to make sure that we are requiring a rigorous energy efficiency section before we start requiring renewable energy.
- Sometimes solar electric systems are more practical at a utility scale as opposed to the building scale. Could have an option where if you cannot put solar on a building then you would need to pay into a utility fund for larger, local solar projects. This would be written in the code as an alternative compliance path.
- This is something that will impact the land use code because we cannot have rooftop units showing. Can solar panels be visible from a rooftop? Would rather see a section that requires a certain percentage of renewable energy or leave the requirement out completely.

- Need to make sure we get buy in from zoning on this issue.
- If City Council and the City are so supportive of renewable energy would visibility be a big issue? It shows that Fort Collins is leader and a "green" city.
- There are projects that have been and are in the process of being built in Fort Collins where solar is extremely visible.
- Federal incentives currently exist for solar. Those are generally around long enough for the price of the technology comes down. Those incentives are constantly changing.
- The costs of solar are already coming down due to an increase in market demand. Part of the intention of this program is market transformation.
- If we are looking at the best options for this code, requiring renewable energy seems like a pretty big jump in costs when there are less expensive, high value items that can be implemented.
- Could this be something that could be required by location? For example, have stricter requirements in areas that have access to more incentives (DDA, XCEL, etc.).
- If the City requires that a certain percentage of the energy of a building be supplied by renewable energy it will help drive energy efficiency. If a building uses less energy to begin with, the amount of renewables required will be lower.
- There could also be several options presented to Council on this issue. Staff could propose a requirement of renewables at 2%, 10%, etc., show the cost impacts of each and then let Council decide.
- If we require a certain percentage of solar we are then forcing the builder to do an energy model to determine how much solar is needed.
- Could CBECS be used to make assumptions based on similar sized buildings of the same use type? If they do not do an energy model they can use a set of assumptions to estimate the amount of solar needed. The code would need to be written clearly.
- If we are going to require a certain percentage of renewable energy it should not be limited to solar. All types of renewable energy should be considered.

- One option could be to have a prescriptive approach that requires a certain percentage of renewable energy and a performance approach where the builder would have to increase the energy efficiency of a building by a certain percentage. The option of paying into a fund for large-scale, local renewable projects in addition to the prescriptive/performance options could also be offered as another way to satisfy this requirement.
- Providing options to owners and builders is critical. This would help create a win-win for all types of renovations and new construction.
- It is typically more cost effective to make a building more efficient than installing renewables. You are providing an option to the builder/owner that is ultimately reaching the same goal.
- For new construction, the builder must do a ComCheck report that includes information on the building envelope and lighting energy use. This form could be used to show an increase in efficiency for the proposed performance path. This could be easily checked and enforced by the building department.

The committee is in favor of developing a requirement that includes the three options mentioned above – a minimum on-site renewables requirement, paying into a renewables fund for local renewable energy, or improving the efficiency of the building commensurate with what the renewable energy would provide. The Solar-ready section will be put aside for now but is not completely off the table.

### ***Homework:***

Review Chapter 7: Water Conservation in the IgCC. Related to energy, we will cover snow melt, waste heat, and outdoor lighting controls.

### **NEXT MEETING**

August 4th – C-TRAC Meeting #7:

3-5:30 p.m. City of Fort Collins Streets Facility