



## Roundtables 3 and 4

### Summary and Moving Forward Evaluation 2009

BCAP held our third Roundtable at the US-DOE National Conference on Energy Codes in Portland, Oregon during July of 2009. Many of the state agencies involved directly with energy codes in their states attended the conference, as well as a broad group of other stakeholders from all over the country. We held our session as a special event in the evening outside of the conference agenda. There were approximately 75 attendees, and, although the hotel moved the discussion to a small room that could not handle the crowd size, we hoped that we could take advantage of the expertise present to have a very profitable roundtable.

We held the fourth Roundtable at the Building Science Westford Symposium in Westford, MA in August 2009. Westford Symposium is a four-day event conducted by the Building Science Corporation (BSC) with attendees from all segments of the building energy efficiency and performance industry. BCAP focused on commercial building compliance and evaluation issues, and 35 people attended representing the commercial building sector, designers, program implementers, code officials and agencies and contractors. We held the discussion in the evening while awaiting the Westford Symposium's "Sumer Camp" dinner event. The audience was engaged and very involved in the discussion.

*For context and a greater understanding of this summary, it is important that the reader reference the preceding two roundtable summaries and introduction document.*

### **The 3rd Roundtable Outcome**

BCAP set the stage for the third Roundtable by focusing discussion on the outcome and product of the first two roundtables. While we found that discussions of the energy code requirements of the Recovery Act distracted this group more than was ideal, the principle focus was to be on the following proposed pilot projects developed from the needs identified in the previous two Roundtable findings:

#### **Compliance Pilots**

- ◆ National outreach campaign to stakeholders – Create the value proposition for energy codes
- ◆ Code Mentors – Building Supply, A/E, Builders Organizations, Code enforcement organizations, etc.
- ◆ Community Energy Efficiency Management (CEEM) – Mentors underwritten by utility, other efficiency programs
- ◆ Conduct training assessments, develop plan for better training approaches
- ◆ Evaluate and case-study advanced code impacts
- ◆ Research and develop 3<sup>rd</sup>-party compliance systems

#### **Evaluation Pilots**

- ◆ Develop national evaluation criteria
- ◆ Benchmarking/Baseline criteria guidance
- ◆ Pilot Recovery Act compliance guidance that includes measuring energy and carbon savings

As mentioned above, comments regarding the positive and negative issues surrounding the Recovery Act distracted from the discussion, but the third Roundtable still managed to yield valuable information on several subjects during the session and in side bar discussions into the late evening. The audience did focus in on several compliance ideas for pilots and further development, as summarized below.

## **Compliance**

The compliance discussions focused on several key pilot concepts that surfaced from previous Roundtables and were fleshed out a bit more by the attendees: 1) Create a national outreach plan to provide education on energy codes to all stakeholders nationwide to create multiple consumer and stakeholder “value propositions”; 2) Build the compliance support infrastructure with energy code mentors ( i.e. mentors in building construction “stream” including building supply, code enforcement, design industry, etc. ); and 3) work with a state or jurisdiction to develop simple, third party energy code compliance mechanisms that might be utilized by other states, (i.e. third party compliance, HERS-As-Codes, etc.). BCAP summarizes these ideas and nascent pilot opportunities as follows:

### 1. National Energy Code Outreach Plan and Program:

- ◆ The audience universally agreed that all stakeholders (code officials, builders, consumers, everyone affected by the codes) must become more aware of energy codes issues if we are to generate the kind of resource support that the energy codes community will need to raise compliance levels to 90%.
- ◆ Several attendees mentioned the need to get consumers involved in driving code compliance. There is need to build the “value proposition” (i.e. lower energy bills, more comfortable, may not actually be enforced as they currently think, etc.) for them, and drive it and consumer involvement in energy code compliance to a higher level.
- ◆ Likewise, we need to drive up the value proposition for code officials (i.e. life/health/safety aspects of energy codes currently undersold, the need to control energy costs for affordable housing in their communities, etc.)
- ◆ There was some interest in home labeling for energy codes as a driver for better consumer awareness of energy codes. The requirement in the 2009 IECC to have a compliance certificate on the home begins to address this issue.

### 2. Build the Compliance Infrastructure<sup>1</sup>:

- ◆ Several people really liked the concept of adding “code mentors” to the energy code support infrastructure wherever possible as a potential pilot project (Stevenson/ICC). The mentors would be current, well-trained code officials that could serve their ICC local and regional building official organizations.
- ◆ We discussed the idea of introducing community energy managers or management. There is a model that may help this inform development of this concept available from programs in the Northwest: the Resource Conservation Managers (RCMs) utilized by utilities to promote energy efficiency programs over the last couple of decades (Cohan, Hogan). This might be an area to research if the Community Energy Efficiency Manager model that BCAP has discussed in past roundtables were to be further developed.

### 3. Third-party compliance pilot

- ◆ Discussion revolved around third party compliance efforts. The group consensus was that the codes community could explore this possibility for energy code compliance, leveraging ICC and other certification and training wherever possible in a model that other states might utilize. Attendees also mentioned HERS-As-Codes pilots as a 3<sup>rd</sup>-party option (Ohio rep. ??).

## **Evaluation**

The third Roundtable did not address evaluation, as the audience focused on compliance-related issues, and we ran out of time. Side bar conversations held with attendees after the main group had departed did indicate that there needed to be a national discussion on evaluation for energy codes, and that codes were largely left out of the various national evaluation conferences and criteria discussions. Attendees who received the Roundtable 1&2 summaries agreed that we needed to move up evaluation on the national agenda and promote a national criteria.

## **Roundtable Four Outcome**

We held the fourth Roundtable at the Westford Symposium in Westford, MA in August. The session focused on commercial building compliance issues, since BCAP had received little feedback on this during previous roundtables. BCAP sent invitations to attendees of the Westford Symposium, chosen as those whose business was primarily commercial construction, design, code enforcement and program development. The result was an attendee group that was very interested in talking commercial buildings, and who brought succinct ideas to the discussion. The initial invitees all received the summaries of the first two

roundtables, and BCAP delivered a brief presentation covering this as well (attached). Since we discovered from past sessions that it was difficult to cover both compliance and evaluation issues in the two hours allotted, we eliminated discussion on evaluation, instead focusing on the following:

- ◆ The audience immediately identified the need for better “integrated design” in all commercial buildings, particularly complex buildings. A mandatory commissioning (Cx) process for buildings over 90,000 square feet would ensure that such “integrated design” happened, as well as be designed to track elements of energy code compliance.

- ◆ For the purposes of better understanding Cx, the following is from the California Commissioning Collaborative<sup>2</sup>:

- i. The term commissioning comes from shipbuilding. A commissioned ship is one deemed ready for service. Before receiving this title, however, a ship must pass several milestones. Equipment is installed and tested, problems are identified and corrected, and the prospective crew is extensively trained. A commissioned ship is one whose materials, systems, and staff have successfully completed a thorough quality assurance process.

- ii. **Building commissioning** takes the same approach to new buildings. When a building is initially commissioned, it undergoes an intensive quality assurance process that begins during design and continues through construction, occupancy, and operations. Commissioning ensures that the new building operates as the owner intended, at least initially, and that building staff are prepared to operate and maintain its systems and equipment.

- ◆ While it is easy to see that the Cx process offers many opportunities to guide the energy efficiency aspects of a building properly through to realization, it is also clear that commissioning goes beyond the points where code compliance usually reviews and inspects buildings, particularly in the planning and review through warranty-end.

- ◇ Attendees began to discuss the shortcoming of the Cx process above as a reason to revisit the process for use in energy code compliance, or adapt part of the process for code compliance. The primary negative issues around using Cx for code compliance are:

- ⇒ Cost: around two percent of the total project cost for commercial buildings, and the question of who pays for it. An attendee mentioned that in France commissioning is required for all commercial buildings by the financier of the buildings. This system is worthy of further research.

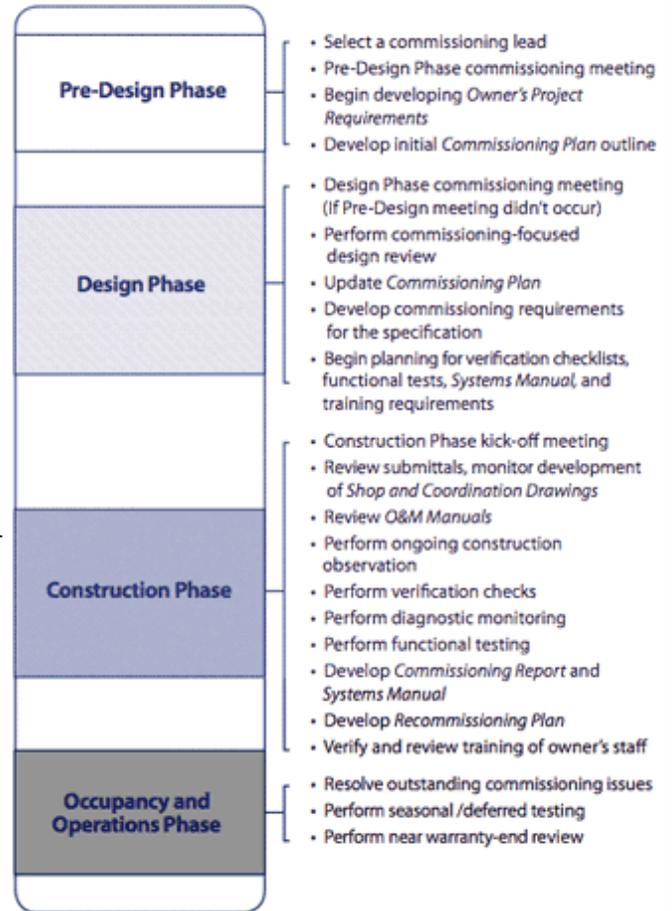
- ⇒ Cx begins at the planning stage, before the code process, and extends to well beyond the completed construction process, requiring systems be tested and inspected through such time as the building warranty is up, which can be seven years or more. Code compliance is not likely to be involved past certificate of occupancy (CO).

- ⇒ There is no consistency in the description of Cx for buildings, and there are multiple certifications for practitioners, leading to some confusion. Nevertheless, attendees still believe criteria could be developed within the models to establish the role of a third party Cx agent in code compliance.

- ◇ The City of Austin, TX is about to commence its Cx project in parallel with the new building energy codes. This model deserves research, as well, and one roundtable attendee will be involved in this process.

- ◇ Massachusetts adopted “Mini-Cx” (called “testing and acceptance”) in its last energy code. However, this provision is not linked to true third party Cx, so attendees from that state report that this requirement is largely ignored.

### Commissioning Process Overview



- ◇ The roundtable attendees were overall very much in favor of Cx as an answer for improving commercial building energy code compliance, and that two percent spent on this process showed clear evidence of improved building energy performance. Attendees cited programs such as LEED, Green Globes and NBI Core Performance as examples of proof that this process was effective.

The group was interested in pursuing this subject further, and one attendee offered to begin a draft of a new Cx regimen to address energy code compliance. A group of six to eight agreed they might assist in this ongoing discussion and effort. (Browning, Aldous, Sanders, Anis, Pastore, Peterson). BCAP will follow up with this group. There was brief mention of the potential for engaging the real estate finance industry in energy code compliance, likely spurred on by the Padian session during the Symposium on the mortgage market and interest in designing products that credited energy efficiency with modeling and measuring true performance used as a mortgage criteria. This potential begs further research and investigation in subsequent projects.

### **Moving On – Action Items from the Roundtables**

BCAP has developed several action items that it will move on as a result of these roundtable activities, either immediately as pilots or ongoing research, or after identification of additional funding. These items include:

**Compliance** Clearly, the roundtables demonstrated the interest, need and opportunity to pilot new elements for the enforcement infrastructure. Attendees mentioned training and placing energy code “mentors” or advisors in the enforcement or building construction process numerous times. Further, there are opportunities to use different types of 3<sup>rd</sup>-party compliance professionals in the field to improve the enforcement infrastructure, particularly in states or regions where code enforcement is under-served. To that end, BCAP has identified several pilots that it will undertake or further investigate for later action. These include:

- ◆ **Energy code “Ambassadors”** – In partnership with the International Code Council (ICC), BCAP will pilot the development of an “energy code ambassadors” program in two to four states. BCAP will work with ICC and its regional representatives to identify code officials who show a high level of interest in energy codes in their communities and regional ICC code official organization chapters. BCAP will work with ICC to develop certified training in codes and related building science to offer to these individuals, and develop an ICC certification for energy code ambassadors who will act as mentors to colleagues in their states’ regional ICC chapters. Once complete, we will forward the Energy Code Ambassadors white paper for greater clarification.
- ◆ **Third party enforcement model** – During the roundtable activities, BCAP heard the concept of third party enforcement as an option for improved compliance many times. As a result, BCAP is working with the state of Maine to develop a 3<sup>rd</sup> party enforcement system that we hope will aid compliance, as well as cover jurisdictions or regions that have weak traditional code compliance because of insufficient resources. We anticipate that this pilot will yield a simple model that other states might be able to adopt. We will document this effort in a white paper report distributed widely through BCAP and other outreach mechanisms.
- ◆ **HERS-As-Codes pilot** – Each Roundtable mentioned the use of energy raters for improved code compliance numerous times, in particular in states or jurisdictions that do not have strong traditional code enforcement in place. During the second Roundtable, an attendee indicated that Vermont showed interest in developing such a system, as there are almost no code officials in the state. Representatives from the state posed the question to DOE as to whether or not they could develop such a system, working from what we can learn from the California model of energy code raters and the various other similar pilots that exist around the country. BCAP will research the various HERS-As-Codes models nationwide and apply the findings to the stakeholder activity that is occurring in Vermont for adoption and implement of the 2009 IECC. The goal will be a white paper describing best practices for the HERS-As-Codes system developed for that state that other states can use, as well.
- ◆ **Commissioning for code compliance** – Roundtable attendees felt that the best way to improve code compliance for commercial buildings was to 1) simplify codes for simple commercial buildings, and 2) require building commissioning (Cx) for complex commercial buildings. Since we are already seeing significant movement in the current code process towards simplifying code requirements for simple commercial buildings (IECC Chapter 5, NBI/DOE “Core Code”, etc.), it seems worthwhile to focus the efforts of this project on developing a Cx model that can work to advance energy code compliance. BCAP

will seek to engage interested parties from the roundtables, as well as Cx implementers in Austin, Texas and other jurisdictions, to develop a whitepaper addressing the elements of a code-friendly Cx criterion that includes code compliance.

- ◆ **Community Energy Efficiency Management (CEEM)** – Pilot the CEEM project in one or more states or jurisdictions. Like the successful RCMs in the Northwest, community energy efficiency management is a concept that is growing interest around the country, especially in the northeast. BCAP will seek to pilot this concept in states that have interest (NY, VT, NH, MA) to potentially support the startup of the community energy efficiency management integrated with existing efficiency programs. The CEEM (manager or management service) will supply code mentoring and circuit-rider training at the community level, aggregating communities in a region to supply these service, as well as others including marketing of utility or public benefit efficiency programs (i.e. NY-NYSERDA, VT - Efficiency Vermont, MA – regional utility Cmte., etc.) BCAP will seek to engage in upcoming pilot efforts in NY based on approval of management, and report findings in a white paper for distribution.
- ◇ **Other infrastructure and training development** – This might include more code mentor opportunities, aimed at the building supply, design or builder communities, etc. to bring advanced training and enforcement opportunities to those entry points in the building construction process. As funding and opportunities arise, BCAP will look at some of these other infrastructure development discussed at the roundtables for potential pilot development. In particular, BCAP will be watching for advanced training models that might be improved and expanded for use in states wishing to do something other than the “same old stuff” that attendees agreed were not very effective at improving compliance, especially if 90% compliance is the goal.
- ◇ **National energy code awareness plan and campaign** – Pending funding identification, BCAP will develop an initial plan and vet it with the roundtable and energy code audiences. The most salient item to come out of the roundtable at the US-DOE National Conference was the feeling that we needed to act on a large scale to promote the overall awareness of energy codes if we are to be able to meet the lofty 90% compliance goal of the Recovery Act. This builds upon the common thread heard throughout the Roundtables that we need to better engage all the stakeholders in improving energy code awareness and understanding to help drive compliance (consumers, code officials, builders, contractors, design professionals, policy makers, local officials, etc.). There needs to be strong demand from all stakeholder sectors to improve energy code awareness and the creation of more value propositions to drive better compliance. For example, code officials need to be educated not only in the chapter and verse code requirements, but also their importance in terms of health/life/safety, environmental and other needs in the built community. Some of our relatively new allies in the environmental community will be engaged in this process.

**Evaluation** The most frequent comments heard throughout the roundtables on the subject of evaluation of energy codes were: 1) the Recovery Act and subsequent funding offered a unique opportunity for states, jurisdictions, and the nation to do some real measurement of energy code efficacy, 2) there was no national criteria for that measurement, and 3) there needs to be a national discussion started to develop a standard criteria. Further, roundtable attendees agreed that such measurement and quantification of energy code savings was necessary to help various entities, such as state public benefit funders and utilities, to invest in much-needed energy code implementation support. Clearly, the discussion on energy code evaluation is just beginning. One attendee at the second Roundtable, well versed in efficiency evaluation, indicated that there is little discussion of energy codes in the evaluation arena. To that end, BCAP promotes the following concept:

**Establish national energy code evaluation criteria** – Based upon interest and additional funding, BCAP will pursue—or find a likely candidate to pursue—the development of a national energy code evaluation criterion. Potential partners for this activity may come from some of our work with utilities and the Code Institutes we are holding around the country.

1 A dozen or so attendees stayed after the session ended to discuss these ideas during sidebar conversations.

2 Haasl, T., and K. Heinemeier. 2006. "California Commissioning Guide: New Buildings" and "California Commissioning Guide: Existing Buildings". California Commissioning Collaborative.