California Commissioning Collaborative Advisory Council Meeting

June 10, 2010

Hosted by Southern California Edison
## Agenda

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker(s)</th>
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<tbody>
<tr>
<td>9:30 a.m.</td>
<td>Welcome, Introductions and Announcements</td>
<td>Phil Welker, CCC</td>
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<td>Kirstin Pinit, CCC</td>
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<tr>
<td>10:00 a.m.</td>
<td>Commissioning Industry Hot Topics</td>
<td>Phil Welker</td>
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<td>10:30 a.m.</td>
<td>BREAK</td>
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<td>10:45 a.m.</td>
<td>PIER PAC meeting</td>
<td>Eliot Crowe, PECI</td>
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<td>Beth Chambers, CEC</td>
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<td>11:45 a.m.</td>
<td>LUNCH</td>
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<td>12:45 p.m.</td>
<td>2006-08 RCx EM&amp;V Report</td>
<td>Bing Tso, SBW</td>
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<td>1:30 p.m.</td>
<td>New Approach to Savings Calculations for RCx Programs</td>
<td>Mugi Lukito, SCE</td>
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<td>Southard Jones, PG&amp;E</td>
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<td>2:15 p.m.</td>
<td>BREAK</td>
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<td>2:25 p.m.</td>
<td>Constant Commissioning: Technology Solutions for Establishing Baselines</td>
<td>Doug Chamberlin, EnerNOC</td>
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<td>and Maintaining Building Performance</td>
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<td>3:10 p.m.</td>
<td>Wrap-Up</td>
<td>Phil Welker</td>
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<tr>
<td>3:20 p.m.</td>
<td>Advisory Council Meeting Adjourns</td>
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Introductions & Announcements
CCC Updates

• CCC Commissioning Guides in use
  – Natural Resources Canada adaptation of new construction guide (www.canmetenergy.nrcan.gc.ca/cx_guide.html)
  – NJ Institute of Technology included RCx process diagram in brochure for their local utility energy conservation program

• Title 24 Training for Building Inspectors and Plans Examiners
  – Developed by CCC/CEC, marketed through CALBO, presented by SMACNA
  – 5 workshop to date: Sacramento (x2), San Jose, San Diego, and City of Industry (attendance 15-20)
  – Upcoming workshops: San Leandro, 6/30 & Fresno, 7/8
  – SMACNA planning 1-2 sessions per month on-going
CCC Updates

New Project: Design-Phase Cx Codes And Standards Enhancement (CASE) Study

• Objective
  – Identify possible code requirements related to early design decision-making processes that will positively impact energy efficiency and building operations and are based on commissioning best practices.

• Key Research Activities:
  – Establish current practice baseline through practitioner survey
  – Develop code proposals
  – Develop CASE study
CCC Updates – Policy Activities

CA Long-Term Energy Efficiency Strategic Plan (CLTEESP)

• CPUC identified CCC as a “champion” for Cx
  – Leadership in developing action plans for 2 Cx milestones
  – Participate in regular meetings on progress and next steps

• Initial outcomes
  – CCC recommendations to be adopted; tactical plans to follow
  – Opportunity to get involved in other Cx-related aspects of the plan
CLTEESP Goal 2: Commercial EB

**Strategy 2-5:** Develop tools and strategies to use information and behavioral strategies, commissioning, and training to reduce energy consumption in commercial buildings.

- Milestones 2-5-2: Strengthen tools and practices for building Cx
- Milestones 2-5-3: Strengthen Building Operator Certification (BOC) training for Cx
Strengthen tools and practices for building Cx

• Enable consistent and cost-effective delivery of comprehensive Cx services
  – Holistic approach; integrated set of measures
  – Persistence strategies to make sure savings last

• Impacts
  – Increased **energy savings** resulting from deeper analysis of opportunities and implementation of improvements
  – Improved **persistence** of benefits by ensuring improvements are maintained over time
  – Increased **cost-effectiveness** of EBCx for owners and utility programs
  – Greater **market awareness** and increased uptake of the practice
Milestone 2-5-2 Roadmap

**Action 1:** Identify, assess, and eliminate barriers to implementation of EBCx as a comprehensive energy efficiency solution.
  − Develop or enhance tools, training and guidance

**Action 2:** Hone outreach and incentive strategies to improve market adoption of EBCx.
  − Increase uptake of EBCx through private initiatives and utility incentive programs

**Action 3:** Establish EBCx approaches for underserved market sectors.
  − Develop approaches, tools, training for high priority sectors (eg. grocery stores, retail, small office, data centers)

**Action 4:** Promote EBCx as a comprehensive and long-lasting solution to reducing whole-building energy use in commercial buildings.
Strengthen Building Operator Certification Training for Cx

- More skilled operators are needed to achieve and maintain energy savings through EBCx
- Existing Cx material is introductory; need for more depth and hands-on experiences to build essential skills

- Impacts
  - Increased energy savings in commercial buildings
  - Improved persistence of energy savings over time
Milestone 2-5-3 Roadmap

**Action 1:** Enhance BOC materials with hands-on instruction and activities, focused on functional testing and the use of diagnostic tools.

**Action 2:** Expand BOC’s Energy Performance Tracking curriculum beyond benchmarking to cover more sophisticated tracking tools/methods.

**Action 3:** Improve outreach in California to increase participation in BOC program.

BOC recommendations developed in collaboration with Northwest Energy Efficiency Council, administrator of national BOC program.
CCC Updates – Policy Activities

• CalGreen Building Code
  – Effective January 1, 2011

• CCC participating on BSC Cx Task Force
  – Provide support/guidance on Cx requirements
  – Initial meeting June 21
  – Follow-up meetings, sub-groups, tasks TBD

• Details on CalGreen
  – BSC website: http://www.bsc.ca.gov/CALGreen/default.htm
CCC Updates – Policy Activities

- Rulemaking 09-11-014 (Ruling and Scoping Memo, Phase 1)
  - Review of CPUC EM&V practices
  - Potential changes to policy & framework prior to IOU planning for 2013-2015 program cycle

- Building Star legislation (proposed)
  - Bill introduced in March; up to $6 billion in rebates and tax incentives for existing commercial and multi-family buildings
  - Comments on Cx issues
Commissioning Industry Hot Topics

June 10, 2010
Phil Welker, CCC
Top Industry Issues

• Standardization
• Persistence
• Training & Workforce Development
Standardization

- Qualifications, expertise, certification, license
- Scope specification at the building-type level
- Outcomes, metrics

Concerns
- Commoditization of the process
- Limits CxA’s from applying expertise/experience
- May not address uniqueness of a given building

Future
Establish minimum standard for process and deliverables
- Owners able to request/evaluate Cx quals and services
  - OR -

Let the market work it out
- CxAs focus on own best business practices, let the industry filter out low bids and low quality
Standardization – CCC’s Role

Publicly Available Resources

- California Commissioning Guides for New and Existing Buildings
- Guidelines for Verifying Existing Building Commissioning Project Savings - Using Interval Data Energy Models: IPMVP Options B and C
- RCx Toolkit – templates and spreadsheet tools
- How to Select a Provider (http://www.cacx.org/resources/selecting.html)
Persistence

Most believe building O&M staff training, turnover, and professionalization are the greatest barriers
  – Knowledge transfer from CxA to operators

Other Issues
  – Utilizing performance metrics, benchmarks
  – Cost, availability, practicality of tools/technology for M&V and ongoing monitoring

Future
It’s fundamentally about people
  – Address knowledge gap between CxA and operators
  – Keep CxA involved in the building over time

Innovative technologies and tools are available – need innovative owners to go there
Persistence – CCC’s Role

PIER Research
• Best Practices for Maintaining Energy Savings from Retrocommissioning (RCx Persistence Guidelines)

Potential work to come under CLTEESP action plans
• Support long-term persistence of energy savings
  – Develop/enhance & promote standardized Cx approaches and tools
  – Enhanced Cx training for building operators
Training/Workforce Development

Concerns
- Training needed for everyone (CxA, operator, owner)
- Not enough technical hands-on training; universities and junior colleges are slow to offer new classes
- Multiple CxA certifications confuse owners; no guarantee of quality

Future
Need to create a much bigger CxA profession
- Promote Cx career path; engage young engineers and train them

Certification should be culmination of training & experience
- Certification organizations should come together and standardize (scope, outcomes, knowledge transfer)

Address the building operator knowledge gap
Training/Workforce Development – CCC’s Role

Commissioning Provider Certification Descriptions
- [http://www.cacx.org/resources/provider_cert.html](http://www.cacx.org/resources/provider_cert.html)

- Work with BSC to clarify CalGreen CxP certification requirement

Potential work to come under CLTEESP action plans
- Enhanced Cx training for building operators
15 Minute Break
PIER PAC Meeting

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Eliot Crowe, PECI
Beth Chambers, CEC
Lunch
2006-2008 RCx EM&V Report

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Bing Tso, SBW
New Approach to Savings Calculations for RCx Programs

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Southard Jones, PG&E
15 Minute Break
Constant Commissioning:
Technology Solutions for Establishing Baselines and Maintaining Building Performance

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Doug Chamberlin, EnerNOC
Wrap Up

Next Meeting: Thursday, September 16
Location: TBD
Host: PG&E

Agenda Topics
• PIER PAC meeting – project updates and discussions
• Technical reports or case studies?
• Your suggestions and requests are welcome
## 2010 Meeting Schedule

<table>
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<tr>
<th>Date</th>
<th>Host</th>
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<tr>
<td>Sept. 16</td>
<td>PG&amp;E</td>
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<tr>
<td>Dec. 2</td>
<td>Sempra (SoCal Gas)</td>
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Adjourn

Thanks to SCE for hosting the meeting today!