



**2011 CABEC Conference**

# **New Certified Energy Analyst (CEA) Program & Examination**

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## **New Certified Energy Analyst (CEA) Program**

- **Background / History**
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- **New CEA Program for the 2013 Standards**
- **CEA Program and Other Stakeholders**
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- **What Will the New CEA Mean for CABEC**
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## **Background / History**

- **1978: Building Energy Efficiency Standards take effect with a performance approach**
- **1983: Residential performance approach becomes widespread under new Title 24 Standards**
- **1985: First organizing meeting of CABEC**
- **1987: CEC hires CALBO to develop a Certified Energy Plans Examiner (CEPE) testing program**
- **1988: Residential & Nonresidential CEPE exams first administered under the 1988 standards**
- **1990: First CABEC Annual Conference focuses on how CABEC can create its own CEA program**

## **Background / History** (continued)

- **1998: CEC ceases to fund CEPE program; CABEC volunteers to take over at no cost to the state**
- **1998 – present: Douglas Beaman Associates and CABEC have kept the CEPE program going [APPLAUSE!]**
- **2007: CEC makes CEPE required for Title 24 documentation to meet NSHP criteria**
- **2009: PG&E's Codes & Standards group with CEC input and others decide to develop a new CEA exam specifically targeted to energy analysts**
- **2010: CABEC Conference in San Luis Obispo indicates Members support this effort**





## **Start of New CEA Program Work**

**Kick-off Meeting January 4<sup>th</sup>, 2011 in Davis included several key stakeholders and participants:**

- **CABEC Board Members and Executive Director**
- **PG&E and Statewide Codes & Standards Team**
- **California Energy Commission Staff**
- **Benningfield Group, Project Manager**
- **Certification Exam Development Experts**

# Residential CEA Examination Development

- Ten “Subject Matter Experts” (SMEs) who are skilled and experienced residential building energy analysts
- Two “psychometricians” (i.e., individuals skilled in developing, administering and interpreting certification tests)
- First task: write a “*Residential CEA Exam Blueprint*” which is a detailed and structured plan that defines:
  - Main “**Competencies**” that an energy analyst must demonstrate;
  - Primary “**Objectives**” for each Competency
  - “**Key Content**” to be tested in each Objective





## **Residential CEA Competencies**

**Six Competencies developed to align with the typical chronological steps in working on a project:**

- 1. Comprehend key residential energy efficiency design concepts and issues***
- 2. Conduct initial project assessment and determine how to apply the 2008 (2013) California Building Energy Efficiency Standards***
- 3. Gather, calculate and organize all information needed for energy modeling***

## **Residential CEA Competencies**

- 4. Model the building with approved energy compliance software***
  - 5. Consider recommendations for improving energy performance and comfort***
  - 6. Analysis and metrics beyond Title 24 energy performance***
- An individual must demonstrate competency in these areas to become a Certified Energy Analyst**
  - Each Competency has several specific Objectives**



## Objectives and Key Content

- Test questions are developed for each of the defined Objectives, and to cover the defined Key Content
- Each Objective is assigned a “Bloom level” which signifies the type or level of ability needed by an energy analyst to meet that Objective
  - **Level 1: “Remember”**
  - **Level 2: “Understand”**
  - **Level 3: “Apply”**
  - **Level 4: “Analyze”**
  - **Level 5: “Evaluate”**
  - **Level 6: “Create”**



## **Listing of Competencies & Objectives**

- **A full listing of the Residential CEA Competencies and Objectives will be available shortly after the Conference on the CABEC web site ([cabec.org](http://cabec.org))**
- **Please feel free to review and give us feedback**



## **What Kind of Questions Will There Be?**

- **Multiple Choice section of the test currently allocated around 70% of the available time**
- **Energy modeling section currently allocated around 30% of the available time**
- **Multiple Choice section will cover all Competencies and Objectives except: “*Create an accurate energy model of a proposed project using state-approved energy modeling software.*”**
- **Energy modeling test will cover the above Objective**
- **Current thinking: a person must pass each section of the test to become a CEA**
- **Feedback to examinees who take the test**

## **Development of Short Answer Questions**

- Each multiple-choice question an “item” which includes a “setup”, a “question”, a “correct answer” and typically three “distractors” (i.e., plausible but wrong answers)
- A subject matter expert – the “Item Writer” (IW) -- creates an item for an assigned Objective
- The item then passes two technical reviewers who make edits and work with the IW to reach a final draft
- The item must also pass two psychometric experts, and finally through a final technical review
- So a total of six people have created, reviewed and/or edited each item before it is alpha or beta tested



## **Energy Modeling Test**

- **Only skill being tested is entering pre-defined building data into CEC-approved energy software**
- **You are handed a detailed input description, then can use your own computer and software (Energy Pro, Micropas or CALRES) to model the building**
- **Save input file and CF-1R to a flash drive provided which you must submit with your answer sheet**
- **Scoring is based on how accurately you modeled around 40 specific inputs listed on the worksheet**
- **For the 2013 exam: proposed energy use may or may not be scored (not yet decided)**

## Today's Residential Beta Test

- 45 people to take the Beta Test: approx. 40% CEAs; 40% CEPEs only; and 20% neither CEA or CEPE
- CABEC will get good statistical data on each of the questions including survey data of each examinee
- 48 multiple-choice questions (approx. 3.5 hrs) + energy model test (approx. 1.5 hrs)
- Beta testers: Bring in any resource you wish, but you can't communicate with anyone during the test
- Beta testers: PLEASE BE IN THE SHELL ROOM BY 11:30 for LUNCH (to the left of & behind the Front Lobby) -- TEST STARTS PROMPTLY AT 12:00



## **New Nonresidential CEA Exam**

- **Similar process as outlined here will begin soon to develop a new Nonresidential CEA exam**
- **Nonresidential Beta Test conducted in Spring 2012**
- **Somewhat different issues and problems to resolve in testing energy analysts on the Nonresidential and High-rise Residential Standards and the Nonresidential energy compliance software**
- **Expect a similar exam format with multiple-choice questions and an energy modeling test section**

## **New CEA Program for the 2013 Standards**

- **2013 Standards scheduled to take effect in January, 2014 (time line below based on that date)**
- **CABEC will retain the current 2008 standards CEPE training and testing through Fall 2012 or Spring 2013**
- **New CEA exams will begin in Fall 2013**
- **New CEA exam questions will be reworked and expanded to include all 2013 standards changes**
- **No one “grandfathered” into the new CEA program**
- **Similar to current CEPE re-certification requirements: once a person has passed the full CEA test, they will have to pass only a shorter re-certification test in subsequent code changes (e.g., 2017, 2020)**



## **CEA Program and Other Stakeholders**

- **CEC has committed to editing the reference in the 2013 Standards New Solar Homes Partnership (NSHP) program guide to “CEA” instead of “CEPE”**
- **2013 Standards language may provide a mechanism for the CEC to specify a CEA required for 2014 Tier 1 energy analysis**
- **Investor Owned Utilities (IOUs) are interested in the new CEA credential as a requirement for participating in the performance-based incentive programs**



## **Future Training Needs**

- **By assessing the results of the Beta Exams, CABEC will gain a wealth of information on which areas of expertise (competencies) current members need more training**
- **CABEC can then work with the IOUs and other partners to develop the best kinds of training in advance of the 2013 standards**



## **What Will the New CEA Mean for CABEC?**

- **With a potentially greater value of new CEA will come greater responsibility for CABEC**
- **Future ongoing costs to maintain new CEA exams, offer and coordinate relevant training should not increase costs for end users**
- **Present and future partnership with IOUs Statewide Codes & Standards team, CEC, CPUC and others will continue to be important**
- **To learn more: read the CABEC Newsletter and attend the 2013 CABEC Conference**

## **Special Thanks**

- **IOUs Statewide Codes & Standards Team: PG&E, SCE, SDG&E and The Gas Company**
- **Benningfield Group Inc.**
- **CABEC Board of Directors**
- **CABEC Executive Director**
- **CABEC CEA Committee**
- **California Energy Commission**

**Doug Beaman**

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**Bruce Benningfield**

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**Martyn Dodd**

**Pat Eilert**

**Jill England**

**Mike Gabel**

**Kevin Gilleran**

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**Craig Hoellwarth**

**Rosemary Howley**

**Elaine Lindheim**

**Cathy Madlin**

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## Questions & Comments