

# BayREN Codes & Standards

**2013 SURVEY REPORT:  
Questions, Responses, Findings  
and Recommendations**

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## Overview

The San Francisco Bay Area Regional Energy Network (BayREN) is a joint effort of the nine Bay Area counties and the Association of Bay Area Governments (ABAG) to promote energy efficiency through regional programs focused on home upgrades, financing tools, and energy codes and standards. The purpose of BayREN's Codes and Standards (C&S) program (the Program) is to (a) establish rates of compliance with Energy and Green Building Codes, (b) identify specific training needs for those involved in code enforcement, and (c) recommend policies for accelerating code compliance.

The Program's Compliance Baseline and Tracking task will establish the compliance rates mentioned above. Initial activities for this task are to:

1. Survey BayREN code compliance stakeholders (primarily building departments) to identify existing code enforcement practices, tools, challenges, and needs, and
2. Recommend, based on survey results, quantitative Compliance Improvement Metrics (CIM) for improving current compliance rates and monitoring compliance improvement over time.

Benningfield Group, Inc. (BGI) developed an online survey tool, using the Survey Monkey™ platform, that is designed to collect information needed to characterize the barriers and best practices associated with improving compliance with the Title 24 Part 6 Energy Code, establish current (baseline) levels of compliance with the 2008 Energy Code, and identify key metrics that can be used by building departments to monitor compliance improvement, beginning with the 2013 Energy Code, effective July 1, 2014.

## Survey Purpose

To accomplish the tasks listed above, BayREN's C&S team needs to understand how building departments do business, what type and volume of permits they process, how familiar they are with the energy code, and what energy measures they verify on paper and in the field. Survey questions were designed to identify:

- a) Existing processes, tools, and best practices for monitoring energy code compliance,
- b) Common problems with and barriers to identifying and enforcing energy code measures,
- c) Energy champions (the most knowledgeable, proactive building departments and staff),
- d) Specific energy code knowledge gaps and training needs, and how common they are, and
- e) Current strategies and best practices for identifying non-permitted building activity.

Given these expectations, the survey includes both objective and subjective questions, and was designed to take no more than fifteen (15) minutes for most respondents to complete.

## Survey Participants

While ABAG building departments are the primary recipients of the Codes and Standards Survey, the BayREN C&S Committee members, who represent each of the nine ABAG counties, also wanted the perspective of local city planners, who are often invested in compliance with the CALGreen building code (Title 24, Part 11), and involved in establishing Reach Codes for their jurisdiction. Also, to obtain a fuller, more comprehensive perspective of code compliance issues, the BayREN C&S Committee members asked their jurisdictions to provide names and contact information of the building designers, contractors, and energy consultants that are actively involved in applying for building permits in their county.

The eight professional roles that were invited to participate in the BayREN Codes & Standards Survey, and which are described in detail in **Appendix B**, are:

- City and County Staff, Public Sector
  - Chief Building Official (CBO)
  - Permit Technician (PT)
  - Plans Examiner (PE)
  - Building Inspector (BI)
  - Planner (P)
- Permit Applicants, Private Sector
  - Building Designer (D)
  - Building Contractor (C)
  - Energy Consultant (EC)

## **Survey Topic Areas**

The C&S survey is designed to collect information on the following topic areas, or categories, the last three of which are subdivided into residential and commercial buildings. Abbreviations are used in the sections that follow:

- Training (T)
- Barriers (B)
- Permit Tracking (PT)
- Compliance Documentation (CD)
- Building Department Resources (BDR)
- CALGreen (CG)
- Reach Codes (RC)
- Commercial, Residential Envelope (CE, RE)
- Commercial, Residential Lighting (CL, RL)
- Commercial, Residential Mechanical (CM, RM)

### ***Energy Code Training Needs***

Characterizing the extent to which building department personnel have been trained to understand and enforce energy code measures helps BayREN gauge the effectiveness of current training efforts, identify perceived gaps in existing training, and recognize general and specific unmet training needs. For example, if the majority of building department personnel report that they don't understand how or why to enforce AC refrigerant charge and airflow requirements, BayREN could recommend specific role-based training on those measures. Survey questions that identify certified energy professionals among building department staff (specifically CABEC CEAs and CEPES<sup>1</sup>) could trigger more directed efforts to increase visibility and value of such certifications. Also, identifying the extent to which jurisdictions actively provide or support energy code training for building department staff could inform best practices for energy training and certification.

### ***Barriers to Energy Code Compliance and Enforcement***

For BayREN to be effective at helping jurisdictions improve energy code compliance, the C&S survey enables and encourages building department staff to be as specific as possible about the problems that hinder their effectiveness. The survey also asked permit applicants to identify and characterize barriers and issues they face in understanding and complying with the energy code.

### ***Permit Tracking, Compliance Documentation, and Building Department Resources***

Learning what processes and tools (e.g., checklists, software, over-the-counter permits) building departments use enables BayREN to recommend ways to integrate energy code enforcement into their existing permitting process. For example, among departments that use an integrated inter-departmental database (e.g., CRW, Accela), we wanted to know what energy-related data they already collect. That information can inform development of energy code compliance metrics and recommended best practices for standardizing data collection across all ABAG counties. Recognizing the variety of Bay Area local governments and jurisdictions, the Survey was designed to enable building departments to characterize their own building activity, priorities, limitations, and enforcement resources.

### ***CALGreen Building and Reach Codes***

CALGreen is the common name for California's Green Building Code—Title 24, Part 11—which became law January 1, 2011. Like other parts of Title 24, CALGreen includes mandatory measures that must be enforced to be effective. BayREN's C&S Committee is interested in whether and how well the relatively new measures are being complied with and enforced, and by whom. Also, many Bay Area governments have adopted Reach Codes that go beyond minimum state requirements, to expedite local progress in achieving greenhouse gas reductions and other environmental goals. It's important to understand these Reach Codes as part of the larger picture, especially because with each 3-year revision of the Energy Code (Part 6), existing Reach Codes become obsolete and must be updated to stay ahead of minimum code.

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<sup>1</sup> The California Association of Building Energy Consultants (CABEC) certifies individuals as Certified Energy Analysts (CEA) and, until recently, Certified Energy Plans Examiners (CEPE).

## ***Energy Code Measures – Envelope, Lighting, Mechanical***

Finding out which specific energy measures each building department currently verifies during plan review and/or field inspection helps BayREN identify and prioritize potential compliance metrics. For example, if only 25% of building departments currently verify NFRC fenestration (window) ratings, and verification of that measure is determined to be:

- Relatively easy to incorporate into their compliance process,
- Relatively high-impact in terms of aggregate energy savings, and
- Even more important going forward because of 2013 code changes,

Those survey results could become a compliance improvement metric for BayREN jurisdictions.

## **Survey Development and Administration**

BayREN's C&S consultant team - Benningfield Group and BKI - worked with BayREN Codes & Standards Committee members to refine the survey topic areas outlined above, and develop appropriate survey questions for the selected recipients. The consultant team then organized the survey content and hierarchy into separate sets of questions based on the eight roles identified above. Each survey participant was presented with the set of questions most appropriate to their role in the energy code compliance and enforcement process.

At the end of the four (4) week survey period, all responses were collected within the survey platform, results were compiled and analyzed, and this BayREN C&S Survey Report prepared. The survey has been left open to allow for additional responses to be collected over the course of the Program's activities.

## **Survey Findings**

This section of the report lists key findings drawn from the responses of Survey participants to each Survey question. When findings are based upon responses common for a specific role, that role is indicated. Some findings include quotes or excerpts from participant comments. For ease of reference, this section follows the order of survey topics listed in **Appendix A**, and each finding or group of findings is followed a reference to the individual question to which it applies.

## **Training**

- Very few building department personnel hold certifications relevant to the energy code. It is unclear whether respondents value CABEC Certified Energy Analyst (CEA) certifications. (T1)
- Email notification is a common form of training notification regardless of the source. Word of mouth via colleagues is an effective way to promote training opportunities, as are utilities, trade associations, and newsletters. (T2)
- Building department staff say that context and understanding are important training elements for contractors ("why is it required," specific dos and don'ts, and incorporating requirements into their design). Contractors need more training on how to read and understand the requirements of the compliance documentation, basic understanding of the code and completing forms. (T3)
- Building department staff feel that practical code application ("how to recognize when energy standards apply to their project," 'coordination with design') is an important training element for designers. Designers need more training on basic understanding of the code, meeting lighting requirements and how to incorporate compliance measures on plans. (T4)
- Building inspectors feel it is important for energy consultants to learn how to convey pertinent information to contractors and inspectors. Energy consultants carry the burden of compliance knowledge and responsibility (e.g., informing their clients that they need to work from the most current plan revision.) (T5)
- Most stakeholders would like training on energy code updates and understanding/navigating compliance forms.
  - Chief building officials (CBOs) want separate in-office training for plan reviewers and building inspectors.
  - Plans examiners want training on "what I should be looking for", "most frequently missed", commercial mandatory measures, and coordination (of plan review) with field inspection.
  - Building inspectors want training in HERS, how incentive programs work, and CALGreen enforcement.
  - Planners want training on energy code requirements that are important to discuss at the design phase, how building officials review projects, and how energy code compliance calculations are done.
  - Energy consultants want training on EnergyPro modeling and the new compliance software; new mandatory HERS measures, forms and registry submittals; and navigating reach codes in the bay area. (T6)

- In-person classroom training is generally considered the most effective. Contractors recognize the role of plan checkers as subject matter experts (a good way to learn the new aspects of the code). One designer said the most effective way to learn is “plan check comments.” (T7)
- Contractors and designers favor specific training that is relevant to their particular type of work. Many attend training for continuing education requirements. (T8)
- Energy consultants think contractors and designers most need training with basic building science and envelope and mechanical measures, and contractors need training in quality installation & compliance documentation. (T9)
- Energy consultants think building inspectors need the most help/training with quality installation, plans examiners need the most help with compliance documentation, and both need help with mechanical measures. Energy consultants think permit technicians need training on energy code navigation. (T10)

## Barriers

- Designers and contractors need training on lighting, envelope and mechanical for commercial and residential buildings. Residential lighting and nonresidential mechanical measures typically have the most field compliance problems. (B1, B4, B8)
- Responses regarding the frequency and effectiveness of means for identifying non-permitted work are inconclusive. (B2, B3, B7). However, they indicate a need to develop a value proposition for consumers (homeowners, building owners) to pull permits and comply with codes.
- Contractors and designers who pull permits (and responded to our Survey) are motivated to do so because “it’s the law” or “it’s required;” in other words, it’s the right thing to do. (B5, B6)
- Compliance forms and paperwork are a deterrent to code compliance.(B9)
  - Forms and paperwork are too confusing, time consuming, and forms don’t correlate with plans easily.
  - Time availability and time management continue to be a barrier to compliance.
  - Difficulty determining applicable requirements was identified as a barrier.
  - Changes made to projects after permit issuance can derail the savings from the energy code and cause complications for field inspectors.
  - The additional inspections triggered by the energy code are seen as a barrier.
  - Please see Appendix A, Question B9 to view the many comments that provide context and illustrate specific issues related to compliance barriers. A sampling of those comments is provided here:
    - One CBO commented: “The regulations have become much too complex and burdensome for enforcement by non-specialists. The entire program should be administered by certificated third parties for energy compliance for both plan review and inspection.”
    - One energy consultant (EC) commented: “No qualifications (are) required to be an Energy Consultant. High bar qualifications should be required of all players, then the work of those professionals will be relied upon more heavily (and) spot-checks would be all that’s needed.”
    - One EC said “Many of the counties covered by BayREN have... no air conditioning due to cool summers. Yet all the compliance documentation refers to A/C and building is required to be modeled with 13 SEER A/C (B9)
- Many building department staff consider code compliance one of their more important job responsibilities. Although the energy code is important, departments don’t have enough time or resources to inspect and enforce. (B10)
- Neighbor complaints are one of the most effective means for identifying potential code violations. Drive-bys are also an effective approach. (B11)

## Permit Tracking

- Almost all jurisdictions who responded use an automated integrated software system to track permits, though very few have energy code compliance components/features. (PT3, PT4)
- More than half the respondents surveyed use the CRW or Accela database platforms to track permits. (PT6)
- Permits commonly issued at the counter include re-roofing, water heater replacement, window replacement, HVAC change-outs, lighting, and insulation. (PT7)

## Compliance Documentation

- The CEC checklist isn't used much. None of the responding permit technicians use checklists. (CD1)
- Building inspectors use some level of prioritization or triage to perform energy field inspections (either flagged by plan checker, or based on prior common errors or level of energy savings potential). (CD3)
- Many building inspectors do not require Compliance Certificates to be posted on commercial job sites. (CD6)
- The performance approach to energy code compliance is almost always used for commercial buildings; it is used for most residential new construction, and seldom used for residential alterations. (CD7)
- Cool roof rating certificates are not frequently seen by building inspectors (only sometimes). (CD9)
- Plans examiners think that for the most part energy code documentation matches information on plans. (CD15)
- Plans examiners do not routinely flag items for special attention by field inspectors. (CD23)
- Plans examiners most often highlight HERS measures, radiant barriers, R-Values, window U-Factor/SHGC and HVAC efficiency on the compliance documentation, for field inspection. (CD24)
- Plans examiners frequently use discretion and attempt to determine if recalls are required when changes are made (they don't automatically request new documentation). (CD28)
- Most of the time the compliance margin has some effect on the level of review given a particular project. (CD30)

## Building Department Resources

- CBOs indicate that field resources pose the greatest challenge to enforcing the energy code. (BDR3)
- Most building departments are active with CALBO. (BDR6)
- Some jurisdictions rely on outside consultants to perform plan reviews and field inspections. (BDR9)
- More CBOs feel their staff need more help with the commercial code than the residential code. (BDR 19)

## CALGreen

- Planners do not know if building departments are enforcing the CALGreen code. (CG1)
- Planners do not know if designers and contractors are complying with CALGreen mandatory measures. (CG5)

## Reach Codes

- While many jurisdictions have a Green or Reach code, most did not have an Energy Ordinance. (RC 2-3)
- Local government resources (e.g., checklists) are useful tools in project review. (RC 7)

## Commercial Envelope

- Though typically required, cool roofs are frequently not installed in re-roof situations; designers claim a higher frequency of cool roof installations than building inspectors typically see. Contractors were largely silent on the topic. (CE1-CE4)

## Residential Envelope

- Close to half the survey respondents report that the R-values on plans match the compliance documentation less than two thirds of the time. (RE2)
- Radiant barriers are found more often in new construction than in re-roofing, although still relatively infrequently. They are also sometimes found in additions. (RE3, RE4)

## Commercial Lighting

- One plans examiner commented that (retail) display lighting is hard to distinguish on the plans. (CL2)
- We are beginning to see specification of demand responsive lighting controls, even though it is a relatively new technology. (CL5)

## Residential Lighting

- Lighting layouts and schedules for residential projects are only sometimes included on the plans. (RL1, RL2)
- Responses indicate that building inspectors are aware of the control requirements for indoor and outdoor lighting but there is still room for compliance improvement. (RL4, RL5)

## Commercial Mechanical

- Contractors indicate that they rarely see control sequence specified on mechanical systems and that this can pose a problem. (CM 2)

## Residential Mechanical

- One-third of PEs say they do not require heating & cooling equipment efficiencies to be specified on the plans. (RM1)
- The volume and efficiency or make and model of gas storage water heating equipment is seldom indicated on residential plans. (RM5, RM8)

## Recommendations

Based on the Survey findings (which are listed individually above) this section of the Report describes the underlying problems or compliance challenges, and recommends activities that might address or mitigate each problem. To clearly align recommendations with the associated findings, some findings from above are restated within this section. These items have been selected because they are most likely to inform:

- Identification of training needs and strategies for meeting those needs,
- Identification of topics to inform forum discussions and key stakeholder and policy maker engagement,
- Planning and prioritizing on-site assessment activities to help determine compliance baselines, and
- Development or adoption of a specific compliance improvement metric (CIM).

For each Survey question topic (e.g., “Training”), related recommendations are organized into categories, e.g., “Certification.”

Not all these recommendations will necessarily be incorporated into BayREN Codes & Standards compliance improvement activities. They also vary in order of priority and ease of implementation. Therefore, each list of recommendations below is sorted based on our estimate of the time, resources, and collaboration required to implement them, beginning with the quickest and easiest. BayREN will work on incorporating the best of both short and long term goals into Program activities, with the recognition that longer term objectives may inform, but will not be a focus of the 2013-14 cycle. For example, renewal of certification for energy plans examiners is a longer term goal that would require collaboration of non-BayREN stakeholders, including CABEC, CALBO, and the CPUC.

## Training

BayREN’s training goals involve identifying specific training needs (related to improving energy code compliance) that are not met by current, existing offerings, and developing strategies for cost-effectively meeting those needs.

### Certification:

**Findings:** Very few building department personnel hold certifications relevant to T24 Part 6. (T1)

**Characterization of Problem:** *There seems to be little perceived value for certification as a means to improve the levels of competency in energy code plan review or field inspection. There are no plans to renew or create a Certified Energy Plans Examiner (CEPE) program for the 2013 code. Like any certification program, if one were created there is no guarantee that efficiency or competency will improve. No mechanism is in place to ensure that building department staff have documented a minimum amount of energy code training.*

### Recommendations:

1. Encourage attendance and documentation of attendance at existing role-specific energy code trainings.
2. Identify and encourage BD staff to attend a progressive series of energy code classes, or coursework.
3. Elevate the importance of addressing the energy code by identifying best performing BayREN building departments and staff, and encourage them to share their knowledge (of energy code measures and enforcement) with other jurisdictions.



4. Define and foster value among building departments for CEPE certification.
5. Support development of CEPE certification for the 2013 code. Involve CALBO, CABEC and other organizations if possible.

### Types of Training Preferred:

**Findings:** Email notification is the most common form of training notification regardless of the source. Word of mouth via colleagues is an effective way to promote training opportunities. (T2) In-person classroom training is generally considered the most effective. Contractors recognize the role of plan checkers as subject matter experts (a good way to learn the new aspects of the code). One designer said the most effective way to learn is “plan check comments.” (T7) Contractors and designers favor specific training that is relevant to their particular type of work. Many attend training for continuing education requirements. (T8)

**Characterization of Problem:** *Although in-person full day classes are considered by most to be effective, many building departments do not have the time to devote to sending staff to these types of training. In addition, many are too general and not tailored to the specific problem or support that the building department or their permit applicants seek. In addition, not enough peer to peer training is available.*

### Recommendations:

1. Partner with code related organizations to link their websites to the BayREN training page.
2. Leverage the credibility of peers and trade organizations to promote energy code-related training. For example, create a referral method (e.g., on the BayREN website) where colleagues rate and recommend attending particular classes or courses.
3. Have BayREN staff or county representatives attend and present (on training opportunities and BayREN resources) at local chapter meetings of stakeholder trade organizations, in collaboration with similar efforts by the CEC.
4. Encourage transfer of knowledge from those who attend existing trainings to their colleagues via brown bag lunch presentations. Develop and provide brown bag toolkits based on abbreviated versions of the training materials. Consider having BayREN provide catering, to increase attendance and participation.
5. Encourage building departments to ‘pay it forward’ in some way, e.g., by hosting a conference call, webinar, meeting or brown bag with other building departments or contractor/designer groups.
6. Develop materials for peer–led classroom training.
7. Create a training where two different groups of people learn the same information in different contexts.  
*For example, plans examiners role play as building inspectors and vice versa. This allows people to identify and relate to why certain requirements and code enforcement activities are important.*

### Training Content Needed:

**Findings:** Building department staff say that context and understanding are important training elements for contractors (“why is it required,” specific dos and don’ts, and incorporating requirements into their design). Contractors need more training on how to read and understand the requirements of the compliance documentation, basic understanding of the code and completing forms. (T3) Building department staff feel that practical code application (‘how to recognize when energy standards apply to their project,’ ‘coordination with design’) is an important training element for designers. Designers need more training on basic understanding of the code, meeting lighting requirements and how to incorporate compliance measures on plans. (T4) Building inspectors feel it is important for energy consultants to learn how to convey pertinent information to contractors and inspectors. Energy consultants carry the burden of compliance knowledge and responsibility (e.g., informing their clients that they need to work from the most current plan revision). (T5) Most stakeholders would like training on energy code updates and understanding/navigating compliance forms. (T6)

**Characterization of Problem:** *The code is elaborate and complex. Many market actors only deal with a part of the code. Even for those who deal with the entire code, application of the code is specific to the context of the permit application being evaluated. Requesting missing forms and plan check corrections delays issuance of a permit.*

### Recommendations:

1. Encourage local certified energy analysts (CEAs) to provide updates and training to builders, designers, and building department personnel.  
*For example, work with building departments to develop and host a “How to Avoid Plan Revision” session led by a respected energy analyst, and attended by current or regular permit applicants.*

2. Help building department staff create handouts, flyers and short cuts on specialized energy code topics, and host demonstrations or meetings for permit applicants, who should also be taught by these materials and during these meetings that any revisions to their project will likely require code compliance revisions.
3. Building department staff could designate and develop one plans examiner/staff member as the in-house *energy code champion* and provide access to that energy code expert at the counter and by phone or email.
4. Create sample wording, (key note) handouts, and schedules of energy code measures for applicants to include on plans. Clearly identify the energy code elements that will be checked during plan review.
5. Encourage non-certified energy consultants to become CEAs (so that their credibility and expertise is validated) by making it required or adding value.

*For example, expedite processing or reduce permit fees for those prepared and signed by a CEA.*

## Barriers

One of BayREN's C&S program goals is to identify specific, systemic barriers to improving energy code compliance. Learning what various stakeholders find to be the biggest barriers is critical in attempting to overcome them.

### Lack of Knowledge and Understanding of the Energy Code

**Findings:** Designers and contractors need training on lighting, envelope and mechanical for commercial and residential buildings. Residential lighting and nonresidential mechanical measures typically have the most field compliance problems. (B1, B4, B8)

**Characterization of Problem:** *The lack of understanding of energy code requirements, in particular how to apply the building code properly and create error-free documentation, is pervasive among permit applicants. Plans examiners need help in navigating the energy code and compliance documentation, and building inspectors also need help in identifying and prioritizing energy code measures for field verification.*

#### Recommendations:

1. Encourage building department staff to attend IOU *Standards Essentials* training for PEs and BIs.
2. Residential lighting is one of the permit scenarios for which building departments could provide simplified handouts of mandatory measures and compliance documentation (see training recommendations above). Use California Lighting Technology Center (CLTC) handouts, and post them on BayREN's training website.
3. BayREN building department energy code handouts should target designers, but be available to builders and contractors. Separate by residential and nonresidential buildings, and envelope, mechanical, and lighting measures.
4. Create targeted job aids or specialized classes around the disciplines recommended for emphasis based on survey results. (RES: Lighting and Nonresidential Mechanical for designers and builders)

### Non-Permitted Building Activity

**Findings:** Responses to questions about the extent of non-permitted building activity are inconclusive, although neighbor complaints are one of the most effective ways to identify violations. (B2, B3, B7, B11) Contractors and designers who pull permits and responded to our Survey are motivated to do so because "it's the law" or "it's required," i.e., it's the right thing to do. (B5, B6) Many building department staff consider code compliance one of their more important job responsibilities. Although the energy code is important, departments don't have enough time or resources to inspect and enforce. (B10)

**Characterization of Problem:** *No accurate methodology exists to identify and gauge the extent of unpermitted building activity, particularly alterations, which are easier to hide. There is a need to develop a value proposition among consumers (building, home owners) to pull permits and comply with building and energy codes.*

#### Recommendations:

1. Read and apply lessons learned from AEC Best Practices report<sup>2</sup> (e.g., the "*be legit, get a permit*" campaign), and the CA IOU's Compliance Improvement Advisory Group's (CIAG) white paper *Help Consumers Realize the Value of Compliance*.<sup>3</sup>

<sup>2</sup> Title 24 Part 6 Best Practices Program Final Report. Dec 2012. Architectural Energy Corporation.

<sup>3</sup> Steve Burger, K. Heinemeier, B. Selby. 2013. Statewide C&S Program Compliance Improvement Advisory Group.

## Energy Code Compliance Documentation

**Findings** Compliance forms and paperwork are a deterrent to code compliance. Forms and paperwork are too confusing, time consuming, and forms don't correlate with plans easily. Time availability and time management continue to be a barrier to compliance. Difficulty determining applicable requirements was identified as a barrier. Changes made to projects after permit issuance can derail the savings from the energy code and cause complications for field inspectors. The additional inspections triggered by the energy code are seen as a barrier. (B9)

**Characterization of the Problem:** *The code is complex and therefore difficult to understand and apply. There are too many forms and forms are created to capture all potential requirements.*

### Recommendations:

1. Work with BayREN building departments to identify the most confusing or time-consuming aspects of energy code compliance documentation and develop corresponding but more user-friendly forms.
2. Work with the CEC and other stakeholders to simplify energy code compliance forms and paperwork. Start with the 2013 forms, which are more numerous but more specific to individual permit scenarios.
3. Local governments or building departments might consider hiring or contracting with certified specialists to help with energy code compliance, e.g., CEAs for plan reviews, and HERS raters for field inspections.

## Permit Tracking

In order for BayREN to help building departments improve energy code compliance as efficiently as possible, we need to understand their existing permit processes, or business models, which vary considerably among jurisdictions.

## Integrated Software Systems

**Findings:** Almost all jurisdictions who responded use an automated integrated software system to track permits, though very few have energy code compliance components/features. (PT3, PT4) More than half the respondents surveyed use the CRW or Accela database platforms to track permits. (PT6) Permits commonly issued at the counter include re-roofing, water heater replacement, window replacement, HVAC change-outs, lighting, and insulation. (PT7)

**Characterization of the Problem:** *Most jurisdictions use some type of customized data management system to track building permits (among other local government activities), so they have the potential to track energy code compliance data. BayREN has an opportunity to leverage this technology to track energy code compliance.*

### Recommendations:

1. Find out which energy code compliance information is currently being compiled by BayREN BDs, manually or electronically, and what additional energy code-related data would be useful in helping to determine compliance baselines and monitor compliance improvement.
2. Recommend a standard set of energy code compliance data to be tracked by all BayREN jurisdictions.
3. Organize groups of jurisdictions with the same permit tracking software vendor, and work with them and the vendor to develop an energy code compliance module.

## Over-the-Counter Permits

**Findings:** Permits typically issued at the counter include re-roofing, water heater replacement, window replacement, HVAC change-outs, lighting, and insulation. (PT7)

**Characterization of the Problem:** *All these types of permits trigger the energy code, but without plan review, it's less likely that energy code measures will be enforced. There is a need to improve energy code compliance without major changes to building department processes.*

### Recommendations:

1. Develop and provide handouts for applicants summarizing energy code requirements for each type of over-the-counter permit. Building inspectors could use the handouts to field-verify these measures.
2. For over-the-counter permit types, develop packages of above-code measures that if followed, will expedite permitting and ensure positive energy code compliance margins.

## Compliance Documentation

A key step in developing compliance baselines and improvement metrics is to find out what tools building departments are already using to guide their review and inspection of energy code measures, and what energy code compliance data they already capture.

### During Plan Review

**Findings:** The CEC checklist isn't used much. None of the responding permit technicians use checklists. (CD1) Plans examiners think that for the most part energy code documentation matches information on plans. (CD15) Plans examiners do not routinely flag items for special attention by field inspectors. (CD23) Plans examiners most often highlight HERS measures, radiant barriers, R-Values, window U-Factor/SHGC and HVAC efficiency on the compliance documentation, for field inspection. (CD24) Plans examiners frequently use discretion and attempt to determine if recalls are required when changes are made (they don't automatically request new documentation). (CD28) Most of the time the compliance margin has some effect on the level of review given a particular project. (CD30)

**Characterization of the Problem:** *Plans examiners bear the burden of energy code enforcement. PEs need help identifying and prioritizing energy code measures to check during plan review, and to flag for building inspectors to verify on site. Some PEs don't use checklists to guide their plan review, and so may not be checking some energy code measures.*

#### Recommendations:

1. During on-site compliance assessment visits, review checklists that plans examiners have developed, identify the most effective features, and develop a prioritized energy code checklist for BayREN PEs.
2. Develop a prioritized list of energy code measures for plans examiners to flag for building inspectors to verify in the field; include cool roof ratings (a high priority for peak reduction) and measures that some PEs already flag for field verification.
3. For permits using the performance approach, develop guidelines that plans examiners can use to assess the level of plan review and field inspection needed. For example, when there are discrepancies between plans and energy documentation, illustrate how to assess whether the energy modeling need to be redone. Also, when the compliance margin is unusually tight (or large), encourage PEs to flag energy code measures for verification by building inspectors.

### During Field Inspection

**Findings:** Building inspectors use some level of prioritization or triage to perform energy field inspections (either flagged by plans examiner, or based on prior common errors or level of energy savings potential). (CD3) Cool roof rating certificates are not frequently seen by building inspectors (only sometimes). (CD9)

**Characterization of the Problem:** *Building inspectors need guidance to identify and prioritize energy code measures that need to be verified in the field. When compliance problems are identified in the field, it's important to follow up by documenting the issue, specifying the solution(s), and re-inspecting to verify and document compliance.*

#### Recommendations:

1. Develop a CIM for building inspectors to verify, and document verification of, energy code measures that the plans examiner has flagged for them. Include building equipment/components as well as related installation quality. This CIM is directly related / linked to the similar CIM for PEs.  
*For example, when verifying the volume and energy factor of a new water heater, verify that the pipes on each side are properly insulated. When the compliance margin is unusually high, verify special energy features are properly installed.*
2. Develop a CIM for building inspectors to (a) document specific incidents of non-compliance (b) require that the non-complying measure be made compliant, and (c) re-inspect to verify and document compliance.
3. Similar to the recommendation for plans examiners, for permits using the performance approach, if a building inspector has any doubt about whether a discrepancy between as-built and energy code documentation impacts compliance, help them determine whether the energy modeling must be re-done. This could foster communication and collaboration between building inspectors and plans examiners.
4. Similar to previous recommendations for preparing handouts summarizing energy code requirements for common permit scenarios, develop a CIM for permit technicians to provide building inspectors with the same checklist of energy code requirements that are given to the applicant for over-the-counter (OTC) permits.  
*For example, develop a handout for OTC re-roofing permits that includes an explanation of the importance of cool roofing, a sample CRRC rating, a table summarizing requirements (roof slope, roofing density, and CRRC specs), list of exemptions, and compliance checklist.*

## Building Department Resources

To help building departments improve energy code compliance BayREN needs to understand what internal resources, i.e., personnel, are available to them and what outside resources they tend to rely on for information, e.g., about code enforcement.

**Findings:** CBOs indicate that field resources pose the greatest challenge to enforcing the energy code. (BDR3) Most building departments are active with CALBO. (BDR6) Some jurisdictions rely on outside consultants to perform plan reviews and field inspections. (BDR9) More CBOs feel their staff need more help with the commercial code than the residential code. (BDR 19)

**Characterization of the Problem:** *Building departments are hard pressed to enforce all aspects of the energy and green building codes in addition to their other responsibilities, which include enforcing California Title 24 building (structural), electrical, plumbing, and mechanical codes. BayREN's efforts to help improve compliance with the Energy Code should leverage outside resources that BDs already use, specifically CALBO and private consultants.*

### Recommendations:

1. Engage CBOs to encourage or require PEs and BIs to attend IOU Standards Essentials classes.
2. Engage CBOs to identify and support one nonresidential energy code champion within each jurisdiction.
3. Engage CALBO in offering continuing education credits (or equivalent) for attending energy code classes.
4. Engage ICC in developing a CA T24 Part 6 certification for plans examiners and building inspectors.
5. Support development of CEPE certification for the 2013 energy code. Involve CALBO and other related organizations if possible. (This is also a recommendation under Training – Certification)

## CALGreen

In addition to the Title 24 Energy Code (Part 6), BayREN needs to understand whether and how well the new Green Building Code (Part 11) is being complied with and enforced.

**Findings:** Planners do not know if building departments are enforcing the CALGreen green building code. (CG1) Planners do not know if designers and contractors are complying with CALGreen mandatory measures. (CG5)

**Characterization of the Problem:** *CALGreen, Title 24 Part 11, is the newest addition to California building codes for which building departments are presumed to be responsible but not provided with additional resources to enforce. Because it primarily addresses non-energy environmental measures, including land use, water conservation and indoor air quality, city planners have been most interested in CALGreen compliance and enforcement.*

### Recommendations:

1. Encourage discussion within and among BayREN jurisdictions about how to manage CALGreen compliance and enforcement issues. Invite all relevant departments, including planning and building, public health, waste and water management.
2. Engage East Bay and other BayREN municipal utility district (MUD) representatives to provide on-site / brown bag presentations / training to local governments on why and how to comply with CALGreen requirements.  
*For example, one training could focus on explaining the energy-water nexus, i.e., that saving water is one of the most effective ways to also save energy.*
3. Develop a handout summarizing CALGreen mandatory requirements, including a checklist for identifying those measures that are required as a condition of permit and that will be field-inspected for compliance.
4. Encourage permit applicants and BD staff to attend BayREN's CALGreen training, to be developed.

## Reach Codes

As part of their climate change mitigation goals, many Bay Area local governments adopt policies that encourage or require building energy efficiency, water efficiency, and/or environmental quality measures that exceed code requirements. These reach codes often need to be revised or expanded as the statewide energy and green building codes are updated to include them.

**Findings:** While most jurisdictions have a Green or Reach code, most did not have an Energy Ordinance. (RC 2-3) Local government resources (e.g., checklists) are useful tools in project review. (RC 7)

**Characterization of the Problem:** *Reach codes based on third-party certification programs (e.g., GreenPoint Rated, LEED) are administered and enforced by those programs. However, building departments are often assumed or expected to enforce other local reach codes and ordinances. This puts an added strain on their already limited staff time and resources.*

## Recommendations:

1. Encourage reaching beyond code by creating best practice guides that, when followed, will guarantee beyond-the-code compliance.
2. Develop checklists that include not only minimum requirements but also include 'next tier' improvements.

## Commercial Envelope

**Findings:** Though typically required, cool roofs are frequently not installed in re-roof situations; designers claim a higher frequency of cool roof installations than building inspectors typically see. Contractors were largely silent on the topic. (CE1-CE4)

**Characterization of the Problem:** *Although cool roofs are required in most circumstances, there is a trade off allowed and so the requirement is somewhat conditional and circumstantial. Labels are required in the field but the labels and their installation/location are problematic. Cool roofs aren't obvious by visual inspection (i.e., they're not always 'white'). Re-roofs frequently receive over-the-counter permits, which compounds the problem.*

## Recommendations:

1. Create a guide specifically targeted for the roofing industry, aimed at re-roof installations and targeted for contractors and permit technicians to use when issuing counter permits.
2. Locate and distribute "display samples" of cool roof materials for building departments for staff and contractors to reference.
3. Locate and distribute displays of typical cool roof rating council (CRRC) labels to building departments so that contractors can see what is expected of them.

## Residential Envelope

**Findings:** Close to half the survey respondents report that the R-values on plans do not match the compliance documentation more than one third of the time. (RE2) Radiant barriers are found more often in new construction than in re-roofing, although still relatively infrequently. They are also sometimes found in additions. (RE3, RE4)

**Characterization of the Problem:** *There is still room for improvement in basic communication of energy intent and of reconciliation of plans to energy calculations. In addition, there is more confusion around special measures that are sometimes used than those that are mandatory.*

## Recommendation:

1. Create and distribute a training module that is 'best practice plan communication' that advocates for standardization and consistency around specifications and energy calculation forms on plans.

## Commercial Lighting

**Findings:** One plans examiner commented that (retail) display lighting is hard to distinguish on the plans. (CL2) We are beginning to see specification of demand responsive lighting controls, even though it is a relatively new technology. (CL5)

**Characterization of the Problem:** *Commercial lighting is an appropriate area to target for training.*

## Recommendations:

1. Provide training and encourage deployment of existing training regarding commercial lighting and control strategies
2. Develop Program resources addressing the benefits of demand responsive lighting controls to encourage further adoption.

## Residential Lighting

**Findings:** Lighting layouts and schedules for residential projects are only sometimes included on the plans. (RL1, RL2) Responses indicate that building inspectors are aware of the control requirements for indoor and outdoor lighting but there is still room for compliance improvement. (RL4, RL5)

**Characterization of the Problem:** *Lighting requirements are complicated but have been around long enough that they are generally well understood. Comprehensive lighting design, including specification of fixtures and controls, is still not done frequently enough.*

## Recommendations:

1. Develop Program resources and training content that encourage more detailed lighting design submittals on plans.

2. Develop Program resources and training content that encourage inspectors to focus on inspecting controls for indoor and outdoor lighting.

## **Commercial Mechanical**

**Findings:** Contractors indicate they rarely see control sequences specified on mechanical systems and that this can pose a problem. (CM 2)

**Characterization of the Problem:** *While the specification of energy efficient equipment is relatively straightforward, the design of control systems is typically outside of the world of plan check or field inspection. This is a problem between designers or engineers and contractors, but building departments may be able to help.*

### **Recommendations:**

- Consider hosting a training or forum with mechanical designers and contractors on best practices for control system design.

## **Residential Mechanical**

**Findings:** One-third of PEs say they do not require heating & cooling equipment efficiencies to be specified on the plans. (RM1) The volume and efficiency or make and model of gas storage water heating equipment is seldom indicated on residential plans. (RM5, RM8)

**Characterization of the Problem:** *Some of the most important and easiest to verify residential energy efficiency measures are not always being required, checked or verified by building departments.*

### **Recommendations:**

1. Develop Program resources, and include training content, that encourages plans examiners and building inspectors to check plan specifications and verify the installed capacity and efficiency of residential space heating, space cooling, and water heating equipment.
2. Include space heating, water heating, and air conditioning equipment capacity and efficiency as priorities on the handouts that summarize energy code measures by permit type.

# Appendix A: Survey Responses and Comments

## Key to Table Abbreviations

**Abbreviation**   **Definition**

<i>Sum</i>	Total number of times an answer choice is selected. Some questions allow multiple answer options to be selected.
<i>%</i>	The number of times and answer choice is selected divided by the total number of answers selected
<i>BI</i>	Building Inspector
<i>CBO</i>	Chief Building Official
<i>PT</i>	Permit Technician
<i>P</i>	Planner
<i>PE</i>	Plans Examiner
<i>EC</i>	Energy Consultant
<i>C</i>	Contractor
<i>D</i>	Designer
*	An asterisk indicates that the question allows multiple answers to be chosen

## Training

### T.1 Do you have any of the following certifications? Please check all that apply.\*

Answer Options	Sum	BI	CBO	PT	PE	EC	C	D
<b>Total</b>	<b>92</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>54</b>	<b>9</b>	<b>7</b>
Other (BPI, LEED, etc. Specify in comment box)	29	3	0	0	4	11	5	6
CABEC Certified Energy Plans Examiner - Residential	17	1	0	0	5	10	0	1
CABEC Certified Energy Plans Examiner - Nonresidential	11	1	0	0	3	7	0	0
GreenPoint Rater	11	1	0	0	3	7	0	0
HERS (Home Energy Rating System) Rater	11	0	0	0	0	8	3	0
CABEC Certified Energy Analyst - Residential	6	0	0	0	0	6	0	0
CABEC Certified Energy Analyst - Nonresidential	4	0	0	0	0	4	0	0
ICC CALGreen	3	1	0	0	0	1	1	0

### Comments:

#### Building Inspector

- None (3)
- Certified Green Building Professional
- Master Code Professional, ICC Commercial Energy Plans Examiner

#### Plans Examiner

- LEED (2)
- LEED, CGBP
- CBO AND CIVIL ENGINEER

#### Energy Consultant

- BPI AP & EP
- BPI Analyst, Shell Specialist, Multifamily; HERS BPC - Building Performance Contractor; HERS II Verifier
- BPI Building Analyst and Envelope Professional
- BPI Analyst and Shell, Passive House Rater
- LEED AP BD+C
- You didn't list HERS Analyst or Green Building Analyst, both of which I let expire since there's not much call for either.

- LEED AP, BPI Building analyst, Envelope professional, & Multifamily building analyst
- LEED AP (2)
- LEED Green Associate
- LEED AP, LEED BD&C
- BPI Building Analyst
- I am in the process of becoming a HERS rater.
- LEED AP, Certified Passive House Consultant

#### Contractor

- LEED AP, BPI BA, EP
- BPI B/A
- BPI
- Had a CEPE non res, and HERs

#### Designer

- LEED AP BD+C
- LEED BD+C
- LEED AP
- Build it Green Rater
- BPI Building Analyst



## T.2 How do you hear about training(s)?\*

Answer Options	Sum	%	BI	CBO	PT	PE	P	EC	C	D
<b>Total</b>	<b>139</b>	<b>100%</b>	<b>26</b>	<b>0</b>	<b>6</b>	<b>32</b>	<b>15</b>	<b>34</b>	<b>17</b>	<b>9</b>
Colleagues	38	27%	7	0	2	10	7	8	2	2
Trade Organizations	35	25%	5	0	1	7	2	10	8	2
Newsletters	34	24%	6	0	1	10	3	8	4	2
Other (Specify in comment box)	23	17%	7	0	1	5	2	6	1	1
Social Media	9	6%	1	0	1	0	1	2	2	2

### Comments:

#### **Building Inspector**

- Emails (3)
- PG&E
- program director
- notification from ICC/CALBO chapters
- Pacific Gas & Electric Energy Center, In San Francisco

#### **Permit Technician**

- Emails from local Building Chapters and ICC.

#### **Plans Examiner**

- Email (3)
- ICC Chapter Meetings and CALBO
- PG&E emails, CALBO announcement
- Thru city supported training

#### **Planner**

- E-mail blasts from other organizations related to Energy Efficiency, Climate Change, and Conservation.
- Email alerts.
- Internet surfing and subscription lists.

#### **Energy Consultant**

- Utility emails regarding class training
- CABEC or the CEC
- E-blasts
- Email List of PG&E and Similar
- PGE training calendar, ADPSR, CPBCA list serve, Green Building Advisor, Allison Bales blog, BIG
- CEC announcement lists (listserv), Pacific Energy Center calendar

#### **Contractor**

- E-mail contacts from previous trainings
- Emails from various professional organizations.
- Marin Builders Association

#### **Designer**

- PG&E mostly.
- Emails - PG&E classes, online webinars
- We bring someone in house for an update

### T.3 What Energy Code training do you think contractors need? Please be as specific as possible.

Answer Options	Sum	BI	CBO	PT	PE
<b>Total</b>	<b>42</b>	<b>13</b>	<b>12</b>	<b>2</b>	<b>15</b>
Open-Ended Response	42	13	12	2	15

#### Responses:

##### **Building Inspector**

- Lighting - interior and exterior; Building envelope insulation and sealing; Mechanical systems; ASHRAE 62
- Envelope
- Field Training
- Requirements
- More in the line of inspector & plans examiner training.
- They just need to know about what products are available to them.
- All (3)
- Proper installation techniques, what forms are required and how to fill them out
- Installation and acceptance document completion
- Minimum Energy Code compliance with focus on prescriptive and performance criteria and how this information is conveyed to contractors and inspectors.

##### **Chief Building Official**

- Basic code understanding.
- Mechanical, Envelope, and Lighting
- Part 6 cover to cover not just updates
- The same training that building departments attend.
- The same as the designers. They also need to more fully understand why these standards are in place.
- Remember to read the energy report.
- Required forms and other compliance measures
- Reading and understanding the energy calculations, incorporating these standards into their construction.
- Completing required forms at permit application and final.
- Tell them specific "Don'ts". No skylights beyond 16 sq.ft. for instance
- More than I can put here. The vast majority of the installation and permitting problems come from contractors or installers not knowing the rules or refusing to follow the rules because of the amount of

paperwork. You all need training for Home Owners - they do not understand the requirements to upgrade item X because they are doing Y.

- Plan reading courses, because most of the mistakes they make are a result of not reading the plans
- Same as designers, plus information on what inspectors will be looking for in the field.

##### **Permit Technician**

- Minimum requirements for each type of project they usually do
- As much as possible, most contractors that I make contact with know very little about the Energy Codes.

##### **Plans Examiner**

- Forms needed
- Attending webinars, classroom training and field training.
- All
- Lighting & Mechanical
- Residential and non-residential application and enforcement.
- What forms they need and when to register them
- basic training
- Changes in the Codes from one model to the next
- "Why it is required"
- Plan reading; noticing discrepancies/additional requirements on T24 sheets not mirrored (or clearly mirrored, or buried in notes) elsewhere in plans.
- Title 24 lighting
- Training on how to read and understand the requirements of the compliance forms
- California Energy Code
- Very practical, not theoretical.
- How to read heat loss calculation & construction of the requirements at site.

#### T.4 What Energy Code training do you think designers need? Please be as specific as possible.

Answer Options	Sum	BI	CBO	PT	PE
<b>Total</b>	<b>40</b>	<b>12</b>	<b>12</b>	<b>2</b>	<b>14</b>
Open-Ended Response	40	12	12	2	14

#### Responses:

##### **Building Inspector**

- Lighting
- Field Training
- Changes to code
- They at least need minimal training to know when to submit acceptance forms for review.
- They need to learn the code more so the how to tweak the program
- All and any related training, they are hardly updated about energy codes.
- All
- Minimum code requirements
- Mechanical and Lighting
- Lighting requirements
- 2013 CA Energy Code As Presented By PG&E Energy Center, In San Francisco
- Minimum Energy Code compliance with focus on prescriptive and performance criteria and how this information is conveyed to contractors and inspectors

##### **Chief Building Official**

- Mechanical, Envelope, and Lighting
- Part 6 cover to cover not just updates
- Specific training that relates to their typical projects. Lighting for kitchen and bathroom remodelers, Envelope and lighting for TI Architects.
- Designers themselves have very little training in the energy codes unless they are a sub to the designer that is specifically hired to do just the energy design. I believe that architects and drafts persons are in need of training in the energy codes.
- To learn how to read the energy compliance forms and add to the plans and consider heat source efficiencies matching the FAU for fit in installation. Coordination!
- Mechanical requirements
- How to recognize when energy standards apply to their project.

- Completing forms at permit submittal and final.
- 1 to 2 day class - SEE CABLO CTI
- Seminars
- Specific, detailed training on code requirements and the forms that need to be submitted to the building department.
- Lighting in 2014 will need experts

##### **Permit Technician**

- Changes in the new code.
- This is hit and miss in our jurisdiction. Most of the Architects doing larger projects know of most of the Energy Code requirements, but we also have draftsmen and designers that have very little knowledge and could benefit from a tremendous amount of training.

##### **Plans Examiner**

- Reading the manual, Attending webinars, classroom training and field training.
- All
- Outdoor Lighting & Mechanical
- Residential and non-residential application.
- What forms are needed and when to register them
- Training
- Changes in the Code from one model to the next
- Too broad of a question; it depends on the designer's skill level.
- An overview, so they know how to represent on plans what the energy modeler calculates, and so they can engage in constructive collaboration.
- Title 24 Lighting because of the changes
- When to use which compliance forms
- California Energy Code
- Very practical, not theoretical.
- Coordination of the design and requirements of the energy calculation.

**T.5 What Energy Code training do you think energy consultants need? Please be as specific as possible.**

Answer Options	Sum	BI	PT	PE
<b>Total</b>	<b>23</b>	<b>10</b>	<b>1</b>	<b>12</b>
Open-Ended Response	23	10	1	12

**Responses:**

**Building Inspector**

- Residential standards
- Conference
- Updates
- Any training available as they should carry a burden of compliance responsibility
- They need to learn the code more so the how to tweak the program.
- I don't know.
- New Code requirements
- To look at the framing of the structure
- Minimum Energy Code compliance with focus on prescriptive and performance criteria and how this information is conveyed to contractors and inspectors.

**Permit Technician**

- ?

**Plans Examiner**

- Reading the manual, Attending webinars, classroom training and field training.
- All
- Lighting, Mechanical, Envelope
- Residential and residential
- What forms they need and when to register them
- They do really well...keep on training
- Changes
- Too broad of a question. It depends on the designer's skill level.
- They need to work from final versions of the plans; often designers change the number and size of windows without keeping them informed.
- California Energy Code
- Very practical, not theoretical.
- The experience in the construction method & coordination of the design (Archit. & Struct.)

**T.6 What Energy Code training would you like to have? Please be as specific as possible.**

Answer Options	Sum	BI	CBO	PT	PE	P	EC	C	D
<b>Total</b>	<b>69</b>	<b>12</b>	<b>15</b>	<b>1</b>	<b>13</b>	<b>6</b>	<b>10</b>	<b>5</b>	<b>7</b>
Open-Ended Response	69	12	15	1	13	6	10	5	7

**Responses:**

**Building Inspector**

- HERS and Energy Star
- Energy updates
- Field Training
- Updates to energy code and practical application in the field, and how to read compliance forms
- Seminar/ CEU type training
- More about how the programs work
- Residential energy code training since 99% of our projects are residential
- Better understanding of the forms
- ASHRAE requirements
- all of it
- Recent 2013 updates, overlap with CALGreen, and CEC enforcement within jurisdictions.

**Chief Building Official**

- Mechanical and Lighting
- Part 6 cover to cover not just updates
- Classroom training (2)
- More in office, departmental training.
- Residential and Commercial Standards and updates
- Our staff would like to see one training for plan review staff and a separate training for the field inspection staff.

- Updates and basics for next energy code cycle.
- Energy code update
- Non-res Mech, Light and Envelope
- Completing forms at permit application and final.
- I normally attend CALBO CTI classes for my training.
- A seminar or class that integrates commonalities of requirements between the various codes.
- With the new State Code coming into effect, our staff will need training on implementing the new Code.
- I don't. I have more than enough on my plate to take additional time trying to learn regulations that are beyond my ability to learn and verify. I will have to rely on experts.

**Permit Technician**

- I think any Energy Code training is beneficial, but I believe more residential Energy Code training would be helpful before I try to absorb any commercial requirements.

**Plans Examiner**

- Current regulations and what I should be looking for
- Reading the manual, Attending webinars, classroom training and field training.
- More compliance form classes
- Lighting and Mechanical

- Current or updated residential and non-residential applications.
- Have a quick guide for updates/changes.
- Classes with Gina Rodda. She is easy to understand and makes the classes fun.
- Changes from the old code to the new code.
- 2013 update training; "most frequently missed", "tips from the pros", etc.
- Title 24 lighting
- Commercial Mandatory Measures requirements
- California Energy Code
- Coordination of the design requirement and field installation at site.

### **Planner**

- Basic overview of Energy Code requirements that would be important at design phase of projects to discuss.
- None. Implemented through the Building Division.
- Predominately residential energy code training.
- Should be a general training for Planners about SF-specific codes, plans, and implementations of State code.
- None
- Training on how building officials review projects and how Title 24 calculations are done.

### **Energy Consultant**

- Since I now work as an 3rd party HERS Inspector/Verifier when I do a Duct Leakage Test, a Refrigerant Charge Test, solar PV, QII, etc., I want training in the details of what the Energy Code requires me to inspect or perform. I want to be sure I'm doing these tests correctly.
- The compliance forms and process for submitting them to the various registries.
- Advanced EnergyPro modeling techniques for the new code.
- Webinar summarizing Code changes for professionals.
- Webinar
- How to do takeoffs for the energy code, how to model in compliance software for the energy code, and basics of

mechanical systems and how they relate to the energy code

- Energy Pro
- Navigating through all of the various Green Building/above code ordinances in the Bay Area.
- The new compliance software; also help with various glazing labeling/rating/compliance methods; what Residential performance testing is becoming mandatory? And how can CalCERTS awkward web interface and workflow possibly handle uploads for every single Res project?
- simulation software

### **Contractor**

- None
- Why can we not have more consistent code enforcement?
- The changes coming in the 2013 code change.
- I keep up with current and pending codes.
- An internet site a licensed contractor could have access to, where he could search the site for either general or specific information. Print out PDF's. Have a FAQ section or inter active chat with expert advice.

### **Designer**

- As an architect, a general overview course would be valuable.
- Classroom training on code and calculations the way the code enforcement people understand it, as opposed to understanding the physics and engineering.
- Learning about the paperwork required for Cal Green.
- Webinars
- None at this time
- Architects need general training on how the changes in the energy code are driving design.
- Training for the new code as soon as (or before) it is required. I would also like to find out about the public software version - I've heard there is one (or will be one), but haven't seen it yet. I would like to try it/have training for it - but maybe there is a tutorial for that...

## T.7 What is the single most effective way for you to learn new aspects of the Energy Code?

Answer Options	Sum	%	BI	CBO	PT	PE	EC	C	D
<b>Total</b>	<b>98</b>	<b>100%</b>	<b>19</b>	<b>22</b>	<b>3</b>	<b>21</b>	<b>15</b>	<b>8</b>	<b>10</b>
Classroom Training	41	42%	5	13	2	10	6	1	4
Attending a Conference	20	20%	8	2	1	5	1	1	2
Attending a Webinar	9	9%	1	2	0	0	3	2	1
Reading the Manual	9	9%	1	2	0	1	3	1	1
Reading the Standards	8	8%	0	1	0	4	1	1	1
Field Training	5	5%	3	1	0	1	0	0	0
Asking a Peer or Colleague	3	3%	0	1	0	0	1	0	1
Other (Specify in comment box)	3	3%	1	0	0	0	0	2	0
Calling the Hotline	0	0%	0	0	0	0	0	0	0

### Comments:

#### **Building Inspector**

- CEC Blueprint updates

#### **Chief Building Official**

- Classroom training through Wendy Donaldson is outstanding. Problem is that regulations are so complex that only a shallow understanding is gained. For site-specific information I go to my network.

#### **Permit Technician**

- And I believe hands on training is very important (either in field or in office)

#### **Plans Examiner**

- The hotline is very valuable, but we need classes first.
- PG&E classes and reading the Manual is also effective way to learn new aspects.
- A classroom, not a seminar put on by the energy commission or PG&E taught by a person with few teaching skills.

#### **Energy Consultant**

- Classroom: at this point since I am familiar with the energy measures. If a new measure is introduced, then field training is also very important.

#### **Contractor**

- Ask a plan checker
- Small local meetings about new code requirements have been very successful in our area.
- All of the above are useful BUT the most important thing is to find a way to REQUIRE compliance by licensed professionals.

#### **Designer**

- Plan check comments
- PG&E seminars with Martyn Dodd are an excellent way for architects to keep up to date on what the biggest changes are and how to address them.
- If I have a specific question I can't find an answer to in the manual then I search online to try to find it.

## T.8 What motivates you to take time off work to attend training? Please be specific.

Answer Options	Sum	C	D
<b>Total</b>	<b>15</b>	<b>6</b>	<b>9</b>
Open-Ended Response	15	6	9

### Responses:

#### **Contractor**

- Haven't been motivated yet.
- Building science knowledge sets us apart
- Training in specific areas that relate to my job. We do title 24 CF4R verification inspections and any training pertaining to what we do is important enough to attend.
- I am self-motivated. The issue is HOW to motivate the industry professionals?
- Anything that will give our company a better understanding so we can delivery projects on time and budget.
- A desire to be competent for the job.

#### **Designer**

- Information that I need for a specific project.

- Fulfill requirement for License Renewal or is directly applicable to my work.
- I rarely do so, but it has been only to meet licensing requirements.
- Self-improvement.
- relevant to my business
- Learning units
- Need to keep up to date with codes!
- Usually if it is a subject I am weak on, training is one of the few ways I can learn more or have a person to ask questions of. It helps if the class description sounds like it will cover the topic well and the instructor has good qualifications. I don't like classes that end up being general overviews - but it's not always easy to tell that upfront.

**T.9 With what aspects of the Energy Code enforcement process do contractors and designers need the most help, in terms of targeted training? Please check all that apply.\***

Answer Options	Sum	EC
<b>Total</b>	<b>143</b>	<b>143</b>
<b>Contractors</b>		
Quality Installation	12	12
Compliance Documentation	11	11
Basic Building Science	10	10
Mechanical Measures	10	10
Energy Code Navigation	9	9
Envelope Measures	9	9
Lighting Measures	8	8
Plans and Specifications	4	4
Other (Specify in comment box)	2	2
<b>Designers</b>		
Basic Building Science	10	10
Envelope Measures	10	10
Mechanical Measures	9	9
Compliance Documentation	8	8
Energy Code Navigation	8	8
Quality Installation	8	8
Lighting Measures	7	7
Plans and Specifications	6	6
Other (Specify in comment box)	2	2

**Comments:**

**Energy Consultant**

- Mechanical ventilation, HERS Testing and Verification and CALGreen.
- Indoor air quality mandatory measures - Not something I do as it puts my Professional Liability

Insurance at risk. I'm not a designer, I review the designs & specs of others.

- Combustion safety, building air leakage, duct leakage
- Many designers and some contractors don't even bother to read the Title 24, and/or don't know how to.

**T.10 With what aspects of the Energy Code enforcement process do building department staff need the most help, in terms of targeted training? Please check all that apply.\***

Answer Options	Sum	EC
<b>Total</b>	<b>118</b>	<b>118</b>
<b>Building Inspectors</b>		
Quality Insulation Installation	10	10
Mechanical Measures	8	8
Compliance Documentation	7	7
Basic Building Science	6	6
Envelope Measures	6	6
Energy Code Navigation	4	4
Lighting Measures	4	4
Plans and Specifications	2	2
Other (Specify in comment box)	0	0
<b>Plans Examiners</b>		
Compliance Documentation	8	8
Mechanical Measures	8	8
Energy Code Navigation	7	7
Envelope Measures	7	7
Lighting Measures	6	6
Basic Building Science	4	4
Other (Specify in comment box)	3	3
Plans and Specifications	3	3
Quality Insulation Installation	3	3
<b>Permit Technicians</b>		
Energy Code Navigation	6	6
Basic Building Science	4	4
Compliance Documentation	4	4
Plans and Specifications	3	3
Mechanical Measures	2	2
Other (Specify in comment box)	2	2
Envelope Measures	1	1
Lighting Measures	0	0
Quality Insulation Installation	0	0

**Comments:**

**Energy Consultant**

- CALGreen Standards - Difference between min., Tier I and Tier II - as in Tier I's normally optional, but both building departments and HERS Raters/Green Raters implies required.
- Combustion safety
- Some Building Departments are good about informing applicants about the various documents they will need, but some give applicants the "run-around." BayREN

- should develop a diagram/tree that can be used on BD websites to inform applicants about what they will need to do before applying for permits. This would also go far toward evening out many of the inconsistencies among Building Departments.
- Definition of CFA, different from architect's floor area; Plans examiners ask for small corrections in CF-1R when compliance margin is 45% better than code. Changes have little to no effect on compliance margin.



## Barriers

**B.1 Based on your experience, which building systems typically have the most field compliance problems? Check all that apply and provide details in the comment box.\***

Answer Options	Sum	BI
<b>Total</b>	<b>35</b>	<b>35</b>
<b>Residential Buildings</b>		
Lighting	12	12
Envelope	3	3
Mechanical	3	3
N/A	1	1
<b>Commercial Buildings</b>		
Mechanical	6	6
Lighting	4	4
Envelope	3	3
N/A	3	3

### Comments:

#### **Building Inspector**

- Residential A/C & Furnace Change-Outs + Commercial HVAC Change-Outs.

**B.2 For building alterations that trigger the Energy Code, how big of a problem is non-permitted activity?**

Answer Options	Sum	%	BI	CBO
<b>Total</b>	<b>83</b>	<b>100%</b>	<b>37</b>	<b>46</b>
<b>Residential</b>				
Sometimes 1-33%	16	19%	5	11
Often 34-66%	14	17%	5	9
Usually 67-100%	5	6%	4	1
I don't know	2	2%	0	2
<b>Commercial</b>				
Sometimes 1-33%	24	29%	6	18
Often 34-66%	5	6%	2	3
Usually 67-100%	4	5%	4	0
I don't know	2	2%	0	2

### Comments:

#### **Building Inspector**

- Any And All Non-Permitted Activity Triggers A "REVISION" To The Approved Plan.

#### **Chief Building Official**

- The problem here is that most unpermitted work does not come to the attention of the building department. However, I suspect the amount of unpermitted work is significant.
- I haven't had enough time here to judge. I would guess in the sometime category

**B.3 For commercial alterations, how often do building owners request not pulling a permit?**

Answer Options	Sum	%	C	D
<b>Total</b>	<b>13</b>	<b>100%</b>	<b>3</b>	<b>10</b>
Sometimes 1-33%	5	38%	2	3
Never	3	23%	0	3
N/A	2	15%	1	1
Often 34-66%	2	15%	0	2
Usually 67-100%	0	0%	0	0

**Comments:**

**Designer**

- I tell them up front that I do only licensed and permitted work.

**B.4 For commercial buildings, what aspects of the Energy Code do you find most difficult to understand and/or comply with? Please check all that apply and indicate specific measures in the Comment box.\***

Answer Options	Sum	%	C	D
<b>Total</b>	<b>25</b>	<b>100%</b>	<b>3</b>	<b>22</b>
<b>Additions &amp; Alterations</b>				
Lighting	5	20%	1	4
Mechanical	5	20%	1	4
Envelope	4	16%	0	4
<b>New Construction</b>				
Lighting	5	20%	0	5
Envelope	3	12%	0	3
Mechanical	3	12%	1	2

**Comments:**

**Designer**

- I do some GSA (government jobs) that have require high lighting levels. This conflicts with the low watts-per-square-foot requirements. Also, the materials documentation is a pain. My plans do not usually get that specific about materials.

**B5. For residential alterations that do not involve HVAC systems, what motivates you to apply for a permit?**

Answer Options	Sum	C	D
<b>Total</b>	<b>15</b>	<b>9</b>	<b>6</b>
Open-Ended Response	15	9	6

**Responses:**

**Contractor**

- Company policy
- If necessary as per code, we pull a permit.
- It's required, plus consumer protection
- Compliance with the law
- Same as above. Most work requires a permit number for a loan or rebate. But if a permit is required for a type of work we get one anyway whether we are working on an incentive job or not.
- When it is required

**Designer**

- Getting cooperation from the inspector.
- It is required. I also like the checks that the Inspection process provides. I am often not on the site enough to ensure that code requirements have been met.
- Code compliance
- The Building code requires it.
- NA - see above

**B.6 For residential alterations that involve HVAC systems, what motivates you to apply for a permit?**

Answer Options	Sum	C	D
<b>Total</b>	<b>15</b>	<b>9</b>	<b>6</b>
Open-Ended Response	15	9	6

**Responses:**

**Contractor**

- Being professional
- Company policy;
- Homeowners want it.
- Permits are required for HVAC system work. I always get the permit to protect the customer at resale. It is good for the property to have a 'paper track' of work done. I know that this IS NOT the normal business policy for most contractors.
- It's required, plus consumer protection.
- I usually sub-contract the HVAC work out to a licensed C-20 contractor and I insist they pull a permit on every job. Most of the work I do involves a utility company incentive which requires a permit number in most cases.

- It's required. Home owners do not want any red tape to cut when trying to sell a property.
- it is the right thing to do

**Designer**

- NA - don't typically do work that is just alterations... alterations are usually included in my addition projects & require a permit anyway.
- Getting the permit.
- It is required. I also like the checks that the Inspection process provides. I am often not on the site enough to ensure that code requirements have been met.
- Code compliance
- The building code requires it.

### B.7 For residential alterations, how often do homeowners request not pulling a permit?

Answer Options	Sum	%	C	D
<b>Total</b>	<b>17</b>	<b>100%</b>	<b>9</b>	<b>8</b>
Sometimes 1-33%	11	65%	8	3
N/A	5	29%	0	5
Often 34-66%	1	6%	1	0
Usually 67-100%	0	0%	0	0

#### Comments:

##### Contractor

- If a customer does not want a permit I politely leave. I know that there are plenty of contractors that will be happy to accommodate the 'scoff-laws".
- We walk away from the work in this situation. Usually indicated they are looking for low bid as well.
- Many people would like to work without a permit. I believe I better serve my clients by insisting on permits. I've lost work because I won't work without a permit.

##### Designer

- Never. I tell them up front I only design and administer permitted work.
- I don't do that many.

### B.8 For residential buildings, what aspects of the Energy Code do you find most difficult to understand and/or comply with? Please check all that apply and indicate specific measures in the Comment box.\*

Answer Options	Sum	%	C	D
<b>Total</b>	<b>26</b>	<b>100%</b>	<b>9</b>	<b>17</b>
<b>Additions &amp; Alterations</b>				
Lighting	5	19%	2	3
Mechanical	5	19%	3	2
Envelope	4	15%	1	3
<b>New Construction</b>				
Envelope	5	19%	1	4
Lighting	4	15%	0	4
Mechanical	3	12%	2	1

#### Comments:

##### Designer

- None of it is really difficult to understand. I have run into the most problems from inspectors with plumbing in additions.
- I have consultants that do these for me.
- Our company does a lot of insulation work and we are starting to see the QII credits on plans more and more. I feel the QII specs are too strict. It increases the cost greatly and would be a better and more used measure if it had a bit more leniency in it.
- The refrigerant charge testing. We are limited in how efficient we can get because our most efficient systems have temperature splits that do not land on the Temperature Split Appendices.

## B.9 In your opinion, what are the biggest barriers to Energy Code compliance? Check all that apply.\*

Answer Options	Sum	BI	CBO	PE	EC	C	D
<b>Total</b>	<b>268</b>	<b>40</b>	<b>56</b>	<b>52</b>	<b>52</b>	<b>32</b>	<b>17</b>
Compliance forms/paperwork	36	3	3	7	7	7	5
Insufficient time/resources to inspect/verify energy measures	74	11	20	13	13	6	5
Determining applicable requirements	64	10	14	11	11	12	3
Changes made after the permit is issued	38	6	6	7	7	5	3
Additional inspections triggered by the Energy Code	36	6	7	8	8	3	2
Other (Specify in comment box)	31	5	7	6	6	2	3

### Comments:

#### **Building Inspector**

- Owner builders
- Compliance forms should be with submitted paper work.
- Licensed Contractors that have not been current to their particular trade's "Code Update Cycle"

#### **Chief Building Official**

- Lack of knowledge in the construction industry
- Untrained installers
- The regulations have become much too complex and burdensome for enforcement by non-specialists. The entire program should be administered by certificated third parties for energy compliance for both plan review and inspection.

#### **Plans Examiner**

- Lean staffing, we have to focus on items that kill people (structural)
- Confusing requirements - make them simple and easy to understand for all, customers, contractors and building staff...thank you!
- Applicant resistance to the added costs for preparing /providing energy documentation.
- Cost to owner.
- Lack of understanding by the architects, contractors and owners
- The absolute refusal of the energy commission to prepare a code that easily read, interpreted and is in a format similar to other codes. If you want better enforcement, make it easy for inspectors, plan checkers and the general public to understand.
- Additional requirements per green or ordinance.

#### **Energy Consultant**

- Contracts and costs. Customers tend to go with the lowest bid price, which is often a Contractor willing to cut corners.
- There is a lack of time and training for designers, contractors and building inspectors. They do not recognize the importance in doing energy efficiency measures and making sure they are done correctly. The compliance forms being filled out or filled out properly is a constant barrier. They need to be simplified.
- I think that ALL HVAC contractors need to pressure test their jobs regardless of whether or not a credit for it's been taken. Make it mandatory even if the code disallows it - HVAC contractors are still doing a lousy job, but why're we making a 3rd party check them, when they need to reassure themselves that the job's actually buttoned up before they leave - that's a recipe for finger pointing & continued sloppy

work by HVAC contractors unless they always check their jobs - regardless of state code.

- Costs to the customer
- Insufficient education/information outreach on Green Building measures.
- The Owner-Builder Exemption, and no qualifications required to be an Energy Consultant. High bar qualifications should be required of all players, then the work of those professionals can be relied upon more heavily (less need to thoroughly check everything, rather spot-checks would be all that's needed).
- Many of the counties covered by BayREN have mostly infill construction with no air conditioning due to cool summers. Yet all the compliance documentation refers to A/C and building is required to be modeled with 13 SEER A/C per ACM. This confuses the hell out of designers; they are cynical after this is explained to them. Also, Inspectors don't enforce energy code or mechanical (only plumbing, electrical, structural in my experience). Finally, performance as compared to a fixed EUI rather than a moving target "% better" would help comprehension a lot; it would eliminate the "small house penalty". Finally, compliance forms generated by Epro are impossible to cross-reference with drawings since, for example, window unit IDs don't carry over from software input into forms output.

#### **Contractor**

- Enforcement in the field.
- HVAC contractors who know that code enforcement is non-existent will suggest to clients that money can be saved by not getting a permit
- General contractors are just not ready to embrace the changes required to follow all the new energy codes and at times the building departments are still not educated and are not familiar with what is required.
- The building department officials are overworked and understaffed. They often focus on Health and Safety issues. The industry will generally ignore any requirement that is not mandatory to completing the permitting process. Obtaining permits are OFTEN ignored IF there is a perception that it can be done successfully.
- The code is up for interpretation and the HERS raters sometimes act like GOD or have an attitude and will frequently make poor recommendations to owners or others causing huge unnecessary delays. If a company/contractor has a record of high quality work then the HERS rater needs to acknowledge this and fight for the contractor instead of against.

**Designer**

- The main problem seems to be that the inspectors do not think ahead to cover all aspects of the code on any given visit. Then, they need to come back to see what they missed and want to charge the client for their omissions and negligence in not doing a complete job the first time.
- Have not experienced barriers

- It can be very difficult to determine how to apply the measures to remodels and additions. Also, quite frequently equipment switches are made between when the report is done and delivery of the building.
- My biggest concern is enforcement. I always wonder if what gets specified on the plans actually gets built

**B.10 On a scale of 1 through 5, 1 being "Not Important" and 5 being "Very Important", how would you rank Energy Code (Title 24, Part 6) enforcement relative to your other responsibilities?**

Answer Options	Sum	%	CBO
<b>Total</b>	<b>25</b>	<b>100%</b>	<b>25</b>
4	10	40%	10
5	6	24%	6
3	5	20%	5
2	3	12%	3
1	1	4%	1

**Comments:**

**Chief Building Official**

- In the big picture with all of the code regulations become increasingly more involved, especially disable access, there is not enough time/resources to verify 100% compliance.
- Everything that our department is responsible for is very important.
- As a priority, this falls well below the building, electrical, mechanical, plumbing and fire codes and access and water pollution

**B.11 Please rank the effectiveness of each activity for identifying a potential permit violation.**

Answer Options	Sum	CBO
<b>Total</b>	<b>85</b>	<b>85</b>
<b>Very Effective</b>		
Neighbor Complaints	7	7
CSLB Complaint Form	2	2
Drive By	2	2
Hotline	0	0
<b>Effective</b>		
Hotline	14	14
Neighbor Complaints	14	14
Drive By	13	13
CSLB Complaint Form	7	7
<b>Not Effective</b>		
CSLB Complaint Form	9	9
Drive By	7	7
Hotline	7	7
Neighbor Complaints	1	1

**Comments:**

**Chief Building Official**

- We don't keep track of this to be able to determine effectiveness
- Residential Resale Inspection
- I wish I could have inspectors spending more driving in the community looking for unpermitted work. This is very effective, but we don't have the staffing resources to do enough of this.

## Permit Tracking

### PT.1 Are you responsible for reviewing and approving over-the-counter permits that trigger the Energy Code?

Answer Options	Sum	%	PT
<b>Total</b>	<b>5</b>	<b>100%</b>	<b>5</b>
No	3	60%	3
Yes	2	40%	2

### PT.2 If you answered "No" to the previous question, please indicate the title of the person(s) with that responsibility.

Answer Options	Sum	%	PT
<b>Total</b>	<b>2</b>	<b>100%</b>	<b>2</b>
Open-Ended Response	2	100%	2

#### Responses:

##### *Permit Technician*

- Plans Examiner

### PT.3 Does your Building Department use an integrated software system to track permit activity?

Answer Options	Sum	%	CBO
<b>Total</b>	<b>28</b>	<b>100%</b>	<b>28</b>
Yes	26	93%	26
No, we haven't considered it	1	4%	1
Yes, we are in the planning stages	1	4%	1
No, we decided against it	0	0%	0

#### Comments:

##### *Chief Building Official*

- Accela Automation

### PT.4 Does your integrated software system include Energy Code measures?

Answer Options	Sum	%	CBO
<b>Total</b>	<b>24</b>	<b>100%</b>	<b>24</b>
No	21	88%	21
Yes	3	13%	3

#### Comments:

##### *Chief Building Official*

- Yes, but not in great detail

**PT.5 We would like to obtain specific information on the number of permits issued by your department in each category, over a recent 12-month period. Whom in your office may we contact for that information?**

*There were no responses to this question*

**PT.6 What software vendor do you use?**

Answer Options	Sum	CBO
<b>Total</b>	<b>25</b>	<b>25</b>
Open-Ended Response	25	25

**Responses:**

**Chief Building Official**

- CRW (10)
- Accela (4)
- Permits Plus
- Filemaker (2)
- Sungard (3)
- Trakit (2)
- HTE
- Nono-commercial program
- Greenvue Fusion (2)
- Tyler Eden
- permit soft

**PT.7 What types of permits does your jurisdiction issue at the counter? Please check all that apply.\***

Answer Options	Sum	PT
<b>Total</b>	<b>33</b>	<b>33</b>
Re-roofing	6	6
Water Heater Replacement	6	6
Window Replacements	6	6
HVAC Change-outs	5	5
Lighting	5	5
Insulation	4	4
Other (Specify in comment box)	1	1

**Comments:**

**Permit Technician**

- TI

## Compliance Documentation

**CD.1 Do you use a checklist or other reference tool to ensure the appropriate compliance documentation is provided in the permit application?**

Answer Options	Sum	%	PT	PE
<b>Total</b>	<b>24</b>	<b>100%</b>	<b>3</b>	<b>21</b>
No	12	50%	3	9
Yes, we use one we developed ourselves	9	38%	0	9
Yes, we use one provided from the CEC website	3	13%	0	3
Yes, Other (Specify in comment box)	0	0%	0	0

**Comments:**

**Plans Examiner**

- When needed, the CEC website is used.



**CD.2 During your field inspections of commercial buildings, what Energy Code measures do you most often verify? Please indicate specific measures.\***

Answer Options	Sum	%	BI
<b>Total</b>	<b>26</b>	<b>100%</b>	<b>26</b>
Mechanical	10	38%	10
Envelope	8	31%	8
Lighting	8	31%	8

**CD.3 During your field inspections, how do you prioritize which Energy Code measures to check? Please check all that apply.\***

Answer Options	Sum	BI
<b>Total</b>	<b>33</b>	<b>33</b>
Measures the Plans Examiner flags for me	7	7
No special method	7	7
Measures frequently found missing or wrong based on past experience	6	6
Measures that are labeled 'Special Features'	6	6
Measures that deliver the most energy savings	5	5
Other (Specify in comment box)	2	2

**Comments:**

***Building Inspector***

- I go by the title-24 calculations on the plans
- "HERS Verification Required" + the Certificate Of Compliance Forms & Worksheets On The "Approved Set Of Plans".
- Minimum Energy Code compliance requirements. Field inspection must rely on our knowledge of the minimum requirements due to the management policy that plancheck "move-them-in" and "move-them-out" with no regard for anything but structural reviews.

**CD.4 During your review of initial permit applications, how often is the Certificate of Compliance included in the submittal?**

Answer Options	Sum	PT
<b>Total</b>	<b>17</b>	<b>17</b>
<b>Residential Additions</b>		
Usually 67-100%	3	3
N/A	0	0
Often 34-66%	0	0
Sometimes 1-33%	0	0
<b>Residential Alterations</b>		
Sometimes 1-33%	2	2
N/A	0	0
Often 34-66%	0	0
Usually 67-100%	0	0
<b>Residential New Construction</b>		
Usually 67-100%	3	3
N/A	0	0
Often 34-66%	0	0
Sometimes 1-33%	0	0
<b>Commercial Additions</b>		
Usually 67-100%	2	2
Sometimes 1-33%	1	1
N/A	0	0
Often 34-66%	0	0
<b>Commercial Alterations</b>		
Often 34-66%	1	1
Sometimes 1-33%	1	1
Usually 67-100%	1	1
N/A	0	0
<b>Commercial New Construction</b>		
Usually 67-100%	2	2
Sometimes 1-33%	1	1
N/A	0	0
Often 34-66%	0	0

**CD.5 For commercial projects, how often are all applicable acceptance or installation forms submitted before a Certificate of Occupancy is issued?**

Answer Options	Sum	%	BI
<b>Total</b>	<b>40</b>	<b>100%</b>	<b>40</b>
<b>Additions &amp; Alterations</b>			
Usually 67-100%	7	18%	7
Often 34-66%	5	13%	5
I don't know	4	10%	4
Sometimes 1-33%	4	10%	4
<b>New Construction</b>			
Usually 67-100%	8	20%	8
I don't know	5	13%	5
Often 34-66%	5	13%	5
Sometimes 1-33%	2	5%	2

**Comments:**

**Building Inspector**

- Required @ Building Final / Sign-Off

**CD.6 For commercial projects, how often are all applicable Compliance Certificates posted on the job site?**

Answer Options	Sum	BI
<b>Total</b>	<b>38</b>	<b>38</b>
<b>Additions &amp; Alterations</b>		
I don't know	8	8
Sometimes 1-33%	7	7
Often 34-66%	2	2
Usually 67-100%	2	2
<b>New Construction</b>		
I don't know	8	8
Sometimes 1-33%	5	5
Often 34-66%	4	4
Usually 67-100%	2	2

**Comments:**

**Building Inspector**

- For final inspection we verify forms are on site & with owner
- Required @ Building Final / Sign-Off

**CD.7 For each of the following permit types, please estimate how often the Performance Approach to Energy Code compliance is used.\***

	Answer Options	Sum	PE
<b>Total</b>		<b>137</b>	<b>137</b>
<b>Residential Additions</b>			
	61-80%	<b>6</b>	6
	81-100%	<b>5</b>	5
	41-60%	<b>5</b>	5
	0-20%	<b>2</b>	2
	21-40%	<b>1</b>	1
<b>Residential Alterations</b>			
	0-20%	<b>8</b>	8
	61-80%	<b>6</b>	6
	41-60%	<b>4</b>	4
	21-40%	<b>1</b>	1
	81-100%	<b>0</b>	0
<b>Residential New Construction</b>			
	81-100%	<b>15</b>	15
	41-60%	<b>2</b>	2
	0-20%	<b>1</b>	1
	61-80%	<b>1</b>	1
	21-40%	<b>0</b>	0
<b>Commercial Additions</b>			
	81-100%	<b>11</b>	11
	41-60%	<b>4</b>	4
	61-80%	<b>3</b>	3
	0-20%	<b>1</b>	1
	21-40%	<b>1</b>	1
<b>Commercial Alterations</b>			
	81-100%	<b>7</b>	7
	61-80%	<b>4</b>	4
	0-20%	<b>3</b>	3
	21-40%	<b>3</b>	3
	41-60%	<b>3</b>	3
<b>Commercial Tenant Improvement</b>			
	81-100%	<b>7</b>	7
	41-60%	<b>5</b>	5
	0-20%	<b>4</b>	4
	21-40%	<b>3</b>	3
	61-80%	<b>1</b>	1
<b>Commercial New Construction</b>			
	81-100%	<b>16</b>	16
	<b>41-60%</b>	<b>2</b>	2
	<b>0-20%</b>	<b>1</b>	1
	<b>61-80%</b>	<b>1</b>	1
	<b>21-40%</b>	<b>0</b>	0

**Comments:**

**Plans Examiner**

- Very little prescriptive design
- Most people using the prescriptive requirements are for very minor projects; usually owner / builder. Also more common for reroof and window change outs.

**CD.8 For permit applications based on the Performance Approach, do you verify that current, approved compliance software was used?**

Answer Options	Sum	%	PE
<b>Total</b>	<b>19</b>	<b>100%</b>	<b>19</b>
Yes	18	95%	18
No	1	5%	1

**CD.9 For projects that have cool roofs, how often do you see documentation of the CRRC rating?**

Answer Options	Sum	%	BI
<b>Total</b>	<b>20</b>	<b>100%</b>	<b>20</b>
Sometimes 1-33%	8	40%	8
Often 34-66%	6	30%	6
N/A	3	15%	3
Usually 67-100%	3	15%	3

**Comments:**

**Building Inspector**

- Mostly label reading
- 100%
- ENV-1C Is Required To Be Completed, Signed, Verified & Submitted To The Building Owner.

**CD.10 For residential permits requiring HERS verification, do you always have the completed, signed CF-4R form before doing your final inspection?**

Answer Options	Sum	BI
<b>Total</b>	<b>47</b>	<b>47</b>
<b>Additions &amp; Alterations</b>		
Yes	14	14
No	8	8
N/A	1	1
<b>New Construction</b>		
Yes	18	18
No	5	5
N/A	1	1

**Comments:**

**Building Inspector**

- Documented on the "Approved Set of Plan" for that particular Building Permit.

**CD.11 How often are initial permit applications returned because of incomplete Energy Code compliance documentation?**

Answer Options	Sum	PT	PE
<b>Total</b>	<b>45</b>	<b>5</b>	<b>40</b>
<b>Residential</b>			
Sometimes 1-33%	15	2	13
Often 34-66%	6	0	6
N/A	1	0	1
Never	1	0	1
Usually 67-100%	0	0	0
<b>Commercial</b>			
Sometimes 1-33%	14	3	11
Often 34-66%	6	0	6
N/A	1	0	1
Never	1	0	1
Usually 67-100%	0	0	0

**Comments:**

**Plans Examiner**

- It is more likely that we do not accept the incomplete application than we accept it knowing that it is incomplete and then returning it.
- On the lower side of Often

**CD.12 How often are window specifications (U-factor, SHGC, and visible light transmittance) called out on plans?**

Answer Options	Sum	PE
<b>Total</b>	<b>40</b>	<b>40</b>
<b>Residential</b>		
Usually 67-100%	12	12
Sometimes 1-33%	6	6
Often 34-66%	2	2
I don't know	1	1
N/A	0	0
<b>Commercial</b>		
Usually 67-100%	11	11
Sometimes 1-33%	5	5
Often 34-66%	2	2
I don't know	1	1
N/A	0	0

**Comments:**

**Plans Examiner**

- Mostly SHGC and visible light transmittance is not called out on plans.
- But usually they are called out using a reference to the energy documents for more details
- (This is a standard first round comment.)
- The information is provided by the energy documents copied onto the plans.

**CD.13 How often do building officials ask for additional Energy Code information after the initial plan check?**

Answer Options	Sum	D
<b>Total</b>	<b>17</b>	<b>17</b>
<b>Residential</b>		
Never	3	3
Sometimes 1-33%	3	3
N/A	1	1
Often 34-66%	1	1
Usually 67-100%	0	0
<b>Commercial</b>		
Sometimes 1-33%	5	5
Never	3	3
Often 34-66%	1	1
N/A	0	0
Usually 67-100%	0	0

**Comments:**

**Designer**

- I've never heard from a BO after plan check; if they've asked the contractor for it then that request has never been forwarded to me.

**CD.14 How often do the envelope (walls, floor, ceiling) insulation R-values on the compliance documentation match those on the plans?**

Answer Options	Sum	PE
<b>Total</b>	<b>40</b>	<b>40</b>
<b>Residential</b>		
Usually 67-100%	13	13
Often 34-66%	7	7
I don't know	1	1
N/A	0	0
Sometimes 1-33%	0	0
<b>Commercial</b>		
Usually 67-100%	11	11
Often 34-66%	7	7
I don't know	1	1
N/A	0	0
1-33%	0	0

**CD.15 How often do you find discrepancies between the information specified on the plans and the energy documentation provided?**

Answer Options	Sum	BI
<b>Total</b>	<b>36</b>	<b>36</b>
<b>Residential</b>		
Sometimes 1-33%	13	13
Often 34-66%	3	3
Usually 67-100%	3	3
N/A	0	0
Never	0	0
<b>Commercial buildings</b>		
Sometimes 1-33%	11	11
Often 34-66%	3	3
Usually 67-100%	3	3
N/A	0	0
Never	0	0

**CD.16 How often do you incorporate the Certificate of Compliance into your commercial plan sets?**

Answer Options	Sum	%	C
<b>Total</b>	<b>3</b>	<b>100%</b>	<b>3</b>
Sometimes 1-33%	2	67%	2
Never	1	33%	1
N/A	0	0%	0
Often 34-66%	0	0%	0
Usually 67-100%	0	0%	0

**CD.17 How often do you incorporate the Certificate of Compliance into your residential plan sets?**

Answer Options	Sum	%	C
<b>Total</b>	<b>9</b>	<b>100%</b>	<b>9</b>
Usually 67-100%	3	33%	3
N/A	2	22%	2
Sometimes 1-33%	2	22%	2
Never	1	11%	1
Often 34-66%	1	11%	1

**CD.18 How often do you post applicable Compliance Certificates on the job site?**

Answer Options	Sum	%	C
<b>Total</b>	<b>7</b>	<b>100%</b>	<b>7</b>
Never	3	43%	3
Sometimes 1-33%	2	29%	2
Usually 67-100%	2	29%	2
N/A	0	0%	0
Often 34-66%	0	0%	0

**Comments:**

**Contractor**

- Part of the permit package in most cases
- Whenever it is called for.



**CD.19 How often do you rely on the Certificate of Compliance on the plans to check Energy Code measures?**

Answer Options	Sum	BI
<b>Total</b>	<b>36</b>	<b>36</b>
<b>Residential buildings</b>		
Usually 67-100%	8	8
Sometimes 1-33%	6	6
Often 34-66%	4	4
Never	1	1
N/A	0	0
<b>Commercial Buildings</b>		
Usually 67-100%	10	10
Sometimes 1-33%	4	4
Often 34-66%	2	2
Never	1	1
N/A	0	0

**Comments:**

**Building Inspector**

- We rely on the certificate of acceptance on the plans 100% then verify compliance upwards of 100%

**CD.20 How often do you sign the Certificate of Compliance before submitting plans to the building department?**

Answer Options	Sum	%	C	D
<b>Total</b>	<b>16</b>	<b>100%</b>	<b>7</b>	<b>9</b>
Usually 67-100%	7	44%	1	6
Never	5	31%	3	2
Sometimes 1-33%	3	19%	3	0
Often 34-66%	1	6%	0	1

**Comments:**

**Contractor**

- Are you referring to Title 24 Certifications? These are usually already signed by the professional doing the calculations and the architect. I usually submit the documents and sign for the permit.
- I've only pulled 2 permits this year and whatever had to be signed I signed to get the Certificate of Occupancy. My jobs were in Oakland and Novato

**Designer**

- First I let them see that we will have a certificate of compliance and let them give me a hard time before executing the final CoC.

**CD.21 How often does the building's front orientation on the compliance documentation match that on the plans?**

Answer Options	Sum	PE
<b>Total</b>	<b>37</b>	<b>37</b>
<b>Residential</b>		
Usually 67-100%	14	14
Sometimes 1-33%	3	3
Often 34-66%	2	2
N/A	1	1
I don't know	0	0
<b>Commercial</b>		
Usually 67-100%	14	14
Often 34-66%	3	3
I don't know	0	0
N/A	0	0
Sometimes 1-33%	0	0

**CD.22 How often does the conditioned floor area on the compliance documentation match that on the plans?**

Answer Options	Sum	PE
<b>Total</b>	<b>39</b>	<b>39</b>
<b>Residential</b>		
Usually 67-100%	13	13
Often 34-66%	7	7
N/A	1	1
I don't know	0	0
Sometimes 1-33%	0	0
<b>Commercial</b>		
Usually 67-100%	13	13
Often 34-66%	4	4
Sometimes 1-33%	1	1
I don't know	0	0
N/A	0	0

**CD.23 If the compliance documentation specifies higher-than-prescriptive minimum features, do you highlight those for field inspection?**

Answer Options	Sum	%	PE
<b>Total</b>	<b>20</b>	<b>100%</b>	<b>20</b>
No	14	70%	14
Yes	6	30%	6

**Comments:**

**Plans Examiner**

- Sometimes, short staffed: no time

- No highlight in addition to what is listed on the plans unless it is a very unusual feature
- Rarely see higher than prescriptive minimum feature

**CD.24 If you answered "Yes" to the previous question, what types of measures do you highlight most often?**

Answer Options	Sum	%	PE
<b>Total</b>	<b>5</b>	<b>100%</b>	<b>5</b>
Open-Ended Response	5	100%	5

**Responses:**

**Plans Examiner**

- HERS verifications, High mass, Radiant barrier, radiant floor heat, low U-factors and SHGC,
- Insulation R-values and fenestration U-factor for envelope. Acceptance testing for mechanical. Control credits for lighting.

- Window U-factor and insulation R-values
- Furnace and Water Heater efficiency
- Insulation on building envelop, efficiency of HVAC equipment.

**CD.25 On initial permit applications, how often is the Certificate of Compliance printed on the plan set?**

Answer Options	Sum	PT	PE
<b>Total</b>	<b>44</b>	<b>6</b>	<b>38</b>
<b>Residential</b>			
Usually 67-100%	17	3	14
Often 34-66%	3	0	3
Sometimes 1-33%	2	0	2
Never	1	0	1
<b>Commercial</b>			
Usually 67-100%	17	3	14
Often 34-66%	4	0	4
Never	0	0	0
Sometimes 1-33%	0	0	0

**Comments:**

**Permit Technician**

- We require them to be included on the plan set as well as the booklet version.

**Plans Examiner**

- Minor residential projects are the ones least likely to have the printed certificate

**CD.26 On initial permit applications, how often is the Certificate of Compliance signed by both Building Owner and Documentation Author?**

Answer Options	Sum	PT	PE
<b>Total</b>	<b>44</b>	<b>6</b>	<b>38</b>
<b>Residential</b>			
Usually 67-100%	9	1	8
Often 34-66%	8	1	7
Sometimes 1-33%	4	1	3
N/A	1	0	1
Never	1	0	1
I don't know	0	0	0
<b>Commercial</b>			
Usually 67-100%	8	1	7
Often 34-66%	6	0	6
Sometimes 1-33%	5	2	3
N/A	1	0	1
Never	1	0	1
I don't know	0	0	0

**Comments:**

***Plans Examiner***

- Treating building owner or architect as a single group

## CD.27 What Energy Code compliance information do you retain after final inspection?

Answer Options	Sum	CBO
<b>Total</b>	<b>19</b>	<b>19</b>
Open-Ended Response	19	19

### Responses:

#### Chief Building Official

- Compliance Forms on Plans
- Commissioning report
- Whatever forms that were submitted
- CF4R, CF6R
- CF-1R, ENV, MECH, LTG
- required forms, plans
- All required documentation as specified by current Energy Code
- Everything
- CEC, air balance etc.
- Inspection records, insulation certs if blown or sprayed, HERS if required, etc.

- Performance calculations and mandatory measures
- CF-1R for res.
- All commercial projects.
- Energy Calcs
- Energy Documents and signed inspection paper work
- Depends on type of project. New buildings - all forms, Remodels for Commercial - all forms, Residential - CF forms - all others destroyed after 90 days
- cf6r
- Mandatory required paperwork and a copy of the plans
- We retain the permit application, plans and supporting information

## CD.28 When energy features change after the permit is issued, how often do you require projects to re-submit Energy Code documentation?

Answer Options	Sum	BI	PE
<b>Total</b>	<b>74</b>	<b>35</b>	<b>39</b>
<b>Residential</b>			
Usually 67-100%	18	6	12
Sometimes 1-33%	10	6	4
Never	6	5	1
Often 34-66%	5	2	3
N/A	0	0	0
<b>Commercial</b>			
Usually 67-100%	19	6	13
Sometimes 1-33%	8	5	3
Never	4	3	1
Often 34-66%	3	1	2
N/A	1	1	0

### Comments:

#### Building Inspector

- Only on change of scope
- Depending on how big or small the change is.
- Revisions to address the changes to the "approved set of plans / calculations / documentation".
- Resubmitting to plans examiners that are engineers with no regard for minimum state energy codes only delays results. Review with the supervising inspector and issuing field inspection clarifications produce the best results.

#### Plans Examiner

- Depends on the extent of the change; usually or require revisions for major changes
- Usually for performance based compliance.

**CD.29 When HERS verification is required, do you check the Certificate of Compliance for HERS registration numbers?**

Answer Options	Sum	%	PE
<b>Total</b>	<b>20</b>	<b>100%</b>	<b>20</b>
Yes	15	75%	15
No	5	25%	5

**Comments**

**Plans Examiner**

- Not at plan review time.

**CD.30 When reviewing Performance Approach documentation, how often does the compliance margin affect your level of review?**

Answer Options	Sum	%	PE
<b>Total</b>	<b>21</b>	<b>100%</b>	<b>21</b>
Often 34-66%	9	43%	9
Usually 67-100%	6	29%	6
Sometimes 1-33%	4	19%	4
Never	2	10%	2

**Comments:**

**Plans Examiner**

- Most easily exceed the compliance requirement.

**CD.31 When window specifications are included on the plans, how often do they match those on the compliance documentation?**

Answer Options	Sum	PE
<b>Total</b>	<b>40</b>	<b>40</b>
<b>Residential</b>		
Usually 67-100%	11	11
Often 34-66%	5	5
Sometimes 1-33%	4	4
I don't know	1	1
N/A	0	0
<b>Commercial</b>		
Usually 67-100%	9	9
Often 34-66%	6	6
Sometimes 1-33%	3	3
I don't know	1	1
N/A	0	0

**CD.32 When you're pressed for time so that you have to prioritize, what Energy Code measures do you check?**

Answer Options	Sum	PE
<b>Total</b>	<b>14</b>	<b>14</b>
Open-Ended Response	14	14

**Responses:**

**Plans Examiner**

- That the building complies and lighting
- Heating/cooling, Insulation, Glazing, Lighting and switching, HERS rating
- I'm never pressed for time when plan reviewing
- Envelope
- Insulation values, windows and if radiant barrier is required
- Mandatory measures, r values for walls and u factor for windows
- Envelope: CFA, R-values, fenestration area & u-values Mechanical: All equipment included, equipment efficiencies
- COMPLIANCE MARGIN, EFFICIENCIES, INSULATION AND FENESTRATION
- Insulation, Windows, Mech Efficiencies
- Residential - Glazing U-factor, insulation R-value, the mechanical equipment matches plan. Commercial - Outside air requirements, lighting compliance, Glazing U-factor/insulation R-value
- All
- Equipment efficiency, building envelopes.
- Compliance margin, front facing direction, fenestration, insulation, lighting
- N.A.

**Building Department Resources**

**BDR.1 Do any of your staff have the following certifications? Please check all that apply.\***

Answer Options	Sum	%	CBO
<b>Total</b>	<b>16</b>	<b>100%</b>	<b>16</b>
GreenPoint Rater	6	38%	6
ICC CALGreen	5	31%	5
CABEC Certified Energy Plans Examiner	3	19%	3
HERS Rater	1	6%	1
Other (Specify in comment box)	1	6%	1
CABEC Certified Energy Analyst	0	0%	0

**Comments:**

**Chief Building Official**

- No Certification

**BDR.2 Do you feel that your building department has adequate resources to enforce the Energy Code?**

Answer Options	Sum	%	CBO
<b>Total</b>	<b>27</b>	<b>100%</b>	<b>27</b>
Yes	16	59%	16
No	11	41%	11

**Comments:**

**Chief Building Official**

- Not enough time to enforce 100% of the requirements. We do try for the highlights.
- Can't do an adequate job with existing personnel. New 2013 standards are even more onerous and complex. Too much distraction from our basic duty of protecting property and life safety.

**BDR.3 If you answered "No" to the previous question, please indicate your greatest challenge.**

Answer Options	Sum	%	CBO
<b>Total</b>	<b>11</b>	<b>100%</b>	<b>11</b>
Field resources	5	45%	5
Field technical knowledge	2	18%	2
Other (Specify in comment box)	2	18%	2
Office resources	1	9%	1
Office technical knowledge	1	9%	1

**Comments:**

**Chief Building Official**

- Educating applicants
- Both Office and Field. Financial resources to hire someone to just handle Energy inspection and administration. We cover over 900 miles with just two field inspectors. We are lucky to be able to spend (20) minutes at a time for each

- inspection to inspect everything from code compliance, life & safety and energy.
- Both field and office lack the time to adequately train in, much less adequately enforce this in addition to drainage laws, green code, access, local ordinances, etc.

**BDR.4 For what type(s) of projects do you conduct plan review? Check all that apply.\***

Answer Options	Sum	PE
<b>Total</b>	<b>144</b>	<b>144</b>
<b>Residential</b>		
Alterations	24	24
Additions	23	23
New Construction	22	22
<b>Commercial</b>		
Alterations	20	20
Tenant Improvements	20	20
Additions	19	19
New Construction	16	16

**Comments:**

**Plans Examiner**

- Three or more multi family
- Accessory structures



**BDR.5 Given the complexity of the Energy Code and the limited resources of building departments, which energy measures do you think are the highest priority for building departments to enforce (which measures have the greatest energy savings potential and the least amount of review time).**

Answer Options	Sum	EC
<b>Total</b>	<b>11</b>	<b>11</b>
Open-Ended Response	11	11

**Responses:**

**Energy Consultant**

- Having Contractors obtain building permits for all HVAC change outs. Every furnace sold should require a permit along with the sale, somehow; the problem is how to do it.
- HVAC measures
- Field inspection of all energy measures.
- Indoor air quality options for residential. Kitchen lighting for res. T24, 150K. Fan power issues with nonres; economizer there, is it set for fresh air, does it operate. Actual lighting lamp/ballast specs vs. installed, plus controls settings - do they really work that is were they set & is there an operations manual for the owner & tenant.
- Envelope air sealing & Quality insulation. Duct leakage.
- Performance calculations
- correct windows specifications and areas - mechanical equipment specifications
- Envelope and Mechanical
- When to depend on HERS inspectors. This will become even more crucial with the new code.
- Residential: Window quality per approved specs, Quality Insulation Installation, quality duct installation, continuous air barriers without holes, DHW pipe insulation
- Mechanical systems

**BDR.6 How active is your Building Department in the following Energy Code organizations?**

Answer Options	Sum	CBO
<b>Total</b>	<b>54</b>	<b>54</b>
<b>Very Active</b>		
ICBO	2	2
CALBO	1	1
Other (Specify in comment box)	0	0
<b>Active</b>		
CALBO	11	11
ICBO	6	6
Other (Specify in comment box)	3	3
<b>Fairly Active</b>		
CALBO	7	7
ICBO	7	7
Other (Specify in comment box)	0	0
<b>Slightly Active</b>		
CALBO	4	4
ICBO	1	1
Other (Specify in comment box)	1	1
<b>Not Active</b>		
ICBO	6	6
CALBO	3	3
Other (Specify in comment box)	2	2

**Comments:**

**Chief Building Official**

- ICC Peninsula Chapter
- Building Standards and California Energy Commission hearings

- Please note that the ICBO organization was disbanded in 2000. The reference should be ICC which is the International Code Council.
- ICBO NO LONGER EXISTS. Inspectors attend various local elect/plumbing/mechanical chapters. CBO attends 3-5 ICC chapter meetings/month.

**BDR.7 How many full time equivalent (FTE) employees does your building department have in each of the following roles?**

Answer Options	Sum	%	CBO
<b>Total</b>	<b>70</b>	<b>100%</b>	<b>70</b>
Permit Technician	25	36%	25
Building Inspector	24	34%	24
Plans Examiner	21	30%	21

**BDR.8 How often do you utilize outside consultants to conduct Energy Code plan reviews?**

Answer Options	Sum	%	CBO
<b>Total</b>	<b>28</b>	<b>100%</b>	<b>28</b>
Sometimes 1-33%	14	50%	14
Never	6	21%	6
Usually 67-100%	6	21%	6
Often 34-66%	2	7%	2
Always	0	0%	0

**BDR.9 How often do you utilize outside consultants to conduct field inspections?**

Answer Options	Sum	%	CBO
<b>Total</b>	<b>28</b>	<b>100%</b>	<b>28</b>
Never	14	50%	14
Sometimes 1-33%	11	39%	11
Usually 67-100%	3	11%	3
Always	0	0%	0
Often 34-66%	0	0%	0

**Comments:**

**Chief Building Official**

- Our city is a contract city. All inspections and most of the plan checking is done by consultants with expertise in each field for the project.

**BDR.10 Please indicate which aspects of commercial building design you review.\***

Answer Options	Sum	%	PE
<b>Total</b>	<b>53</b>	<b>100%</b>	<b>53</b>
Comment	0	0%	0
Lighting	18	34%	18
Mechanical	18	34%	18
Envelope	17	32%	17

**BDR.11 Please indicate which aspects of residential building design you review. Check all that apply.\***

Answer Options	Sum	%	PE
<b>Total</b>	<b>72</b>	<b>100%</b>	<b>72</b>
Lighting	25	35%	25
Envelope	24	33%	24
Mechanical	23	32%	23

**BDR.12 What (if anything) do you think your planning department can do to help the building community - architects, engineers, contractors - improve compliance with Energy Code?**

Answer Options	Sum	P
<b>Total</b>	<b>5</b>	<b>5</b>
Open-Ended Response	5	5

**Responses:**

**Planner**

- Provide handouts and information regarding the codes.
- The Planning Department could discuss with their applicant's other options related to Green Building, Water, and Energy Efficiency options based on the design options that might be of interest to the developer.
- Receive training on the Energy Code.
- Develop the General Plan policy basis for Net Zero Renewable Energy Economy, including buildings.
- Assist with information and education about the importance of compliance with the energy code. Support implementation of the Existing Commercial Building Energy Benchmarking Ordinance.

**BDR.13 What interaction, if any, do you have with Energy Code compliance and enforcement?**

Answer Options	Sum	P
<b>Total</b>	<b>7</b>	<b>7</b>
Open-Ended Response	7	7

**Responses:**

**Planner**

- I consult with Building Dept. staff
- Generally work on Energy Efficiency Policy, and manage programs related to Energy Efficiency and Conservation.
- None. Implemented through the Building Division.
- Through plan check and inspection.
- None. (2)
- Attend meetings of the Code Advisory Committee that includes industry, citizens, and Building staff. Work cooperatively on code amendments.

**BDR.14 What type of field inspections do you use outside consultants for?**

Answer Options	Sum	CBO
<b>Total</b>	<b>61</b>	<b>61</b>
<b>Residential</b>		
Mechanical	10	10
Envelope	9	9
Lighting	9	9
<b>Commercial</b>		
Mechanical	12	12
Lighting	11	11
Envelope	10	10

**Comments:**

**Chief Building Official**

- We utilize CSG Consulting for backfill inspection needs.
- Combination inspections.
- All inspections are combination including compliance with all California Codes including which includes all aspects of energy.

**BDR.15. What type(s) of projects do your outside consultants review?**

Answer Options	Sum	CBO
<b>Total</b>	<b>99</b>	<b>99</b>
<b>Residential</b>		
Envelope	16	16
Lighting	16	16
Mechanical	15	15
<b>Commercial</b>		
Mechanical	18	18
Envelope	17	17
Lighting	17	17

**Comments:**

**Chief Building Official**

- Multifamily and commercial new construction utilize outside plan check.
- As needed.

**BDR.16. Which energy measures (if any) do you think are the lowest priority for building departments to enforce (in terms of energy savings potential and time required to verify).**

Answer Options	Sum	EC
<b>Total</b>	<b>10</b>	<b>10</b>
Open-Ended Response	10	10

**Responses:**

**Energy Consultant**

- None. Having been a Home Performance Contractor for several years before focusing on Verifications and Ratings, I want all Contractors to be held to the same high standard.
- Lighting
- Plan checking is not critical if the calculations are performed by a Certified Energy Analyst, otherwise plan checking is very critical.
- Well, I think that they should inspect the way walls are built as that seems to be a way for better energy, but it's not a lower priority - rather it's a place to not forget as wall assemblies are likely to get more complex in the coming

- code. Also, Roof R-values are already going up in Nonres. Make sure that it's really R-30 above, or R-19 below with R-10 above, or R-30 rigid above (I've even done R-38 in nonres lately).
- Prescriptive
  - Overhangs and sidefins verification
  - Plumbing
  - Envelope and fenestration surface areas. They can depend on the CABEC Certified Energy Analyst stamp instead.
  - Residential: ASHRAE 62.2 [Section 150(o)]
  - Lighting

**BDR.17 Which of the following qualifications do you require of outside field inspector consultants?**

Answer Options	Sum	%	CBO
<b>Total</b>	<b>11</b>	<b>100%</b>	<b>11</b>
CALBO Certification	5	45%	5
N/A	3	27%	3
None	3	27%	3
CABEC Certification	0	0%	0
CSLB Licenses	0	0%	0

**Comments:**

**Chief Building Official**

- We only require ICC inspector certifications (4)
- HERS rater

**BDR.18 Which of the following qualifications do you require of outside plan review consultants?**

Answer Options	Sum	%	CBO
<b>Total</b>	<b>18</b>	<b>100%</b>	<b>18</b>
None	9	50%	9
N/A	5	28%	5
CABEC Certified Energy Analyst	2	11%	2
CABEC Certified Energy Plans Examiner	2	11%	2

**Comments:**

**Chief Building Official**

- Certified Plans Examiner
- None currently
- Licensed Professional

**BDR.19 With what aspects of the Energy Code do your staff need help to improve enforcement?**

Answer Options	Sum	CBO
<b>Total</b>	<b>78</b>	<b>78</b>
<b>Residential</b>		
Mechanical	12	12
Lighting	9	9
None	8	8
Envelope	7	7
<b>Commercial</b>		
Mechanical	16	16
Lighting	13	13
Envelope	8	8
None	5	5

**Comments:**

**Chief Building Official**

- Training for Installers and Developers. We are fortunate to have a knowledgeable and experienced staff.
- The biggest challenge we face is time. Specifically, finding the time to enforce all aspects of all the code sections that a local building department is responsible for

**CG.1 Based on your experience, how well are building designers and contractors in your jurisdiction complying with CALGreen mandatory measures?**

Answer Options	Sum	P
<b>Total</b>	<b>18</b>	<b>18</b>
<b>Residential</b>		
I don't know	5	5
Not very well	4	4
Fairly well	0	0
Very well	0	0
Fairly well	0	0
I don't know	0	0
Not very well	0	0
Very well	0	0
<b>Commercial</b>		
I don't know	5	5
Not very well	4	4
Fairly well	0	0
Very well	0	0
Fairly well	0	0
I don't know	0	0
Not very well	0	0
Very well	0	0

**Comments:**

**Planner**

- I don't know. Implemented through the Building Division.
- Contractors and developers are very unfamiliar with the code. Probably have never been trained.

- We are involved in BayREN to find out.
- Novato's green building ordinance relies on Green Point Rated and LEED with contract inspectors.

**CG.3 On a scale of 1 to 5, with 1 being "Not Important" and 5 being "Very Important," how would you rank enforcement of CALGreen Standards (Title 24, Part 11) within your jurisdiction?**

Answer Options	Sum	%	P
<b>Total</b>	<b>8</b>	<b>100%</b>	<b>8</b>
5	4	50%	4
4	2	25%	2
1	1	13%	1
2	1	13%	1
3	0	0%	0

**Comments:**

**Planner**

- I don't know. Implemented through the Building Division.
- State mandated
- Currently not important since Novato's green building ordinance relies on Green Point Rated and LEED.

**CG.4 What aspect(s) of CALGreen do you think are most important for building designers and contractors to understand and comply with?**

Answer Options	Sum	P
<b>Total</b>	<b>6</b>	<b>6</b>
Open-Ended Response	6	6

**Responses:**

**Planner**

- All of CALGreen (2)
- To ensure that insulation is installed correctly.
- I don't know. Implemented through the Building Division.
- Indoor air quality and energy efficiency

**CG.5 What aspects of CALGreen mandatory measures do you think designers and contractors are having the most trouble complying with? Please indicate specific measures in the comment box.**

Answer Options	Sum	P
<b>Total</b>	<b>35</b>	<b>35</b>
<b>Residential</b>		
I don't know	8	8
Environmental Quality	2	2
Material Conservation & Resource Efficiency	2	2
Planning & Design	2	2
Water Efficiency & Conservation	2	2
<b>Commercial</b>		
I don't know	8	8
Environmental Quality	2	2
Material Conservation & Resource Efficiency	2	2
Planning & Design	2	2
Water Efficiency & Conservation	2	2
Please indicate specific measures	3	3

## CG.6 Who do you (or your staff) consult if you have questions about the CALGreen Standards?

Answer Options	Sum	P
<b>Total</b>	<b>7</b>	<b>7</b>
Open-Ended Response	7	7

### Responses:

#### Planner

- Building Dept. staff
- The County Building Official.(2)
- I don't know. Implemented through the Building Division.
- internal green building experts
- Contra Costa County Building Inspection Department

## Reach Codes

### RC.1 Does your agency have development standards (Building Code, General Plan policy, zoning, Climate Action Plan policy) that require building energy efficiency or renewable energy?

Answer Options	Sum	%	p
<b>Total</b>	<b>8</b>	<b>100%</b>	<b>8</b>
Yes (Specify in comment box)	6	38%	6
No	2	13%	2
I don't know	0	0%	0

### Comments:

#### Planner

- County Green Building Ordinance
- The County has produced a DRAFT Climate Action Plan that includes Energy Efficiency Measures, which would be applicable to certain kinds of projects if the DRAFT CAP were to be approved as currently written.
- We require compliance with our Green Building Ordinance.
- Climate Action Plan policy
- It has some old general plan policies. The Department of Building Inspection owns/runs the SF Building Code and the Department of Environment owns/runs the Green Building Ordinance (somewhat in partnership with DBI).
- All of the above.
- We are currently developing an Environmental Action Plan which will include a range of green building programs and policies.
- % over T24 based on project cost.

### RC.2 Does your city or county have a Green or Reach Code?

Answer Options	Sum	%	p
<b>Total</b>	<b>9</b>	<b>100%</b>	<b>9</b>
Yes (Specify in comment box)	6	40%	6
No	3	20%	3
I don't know	0	0%	0

### Comments:

#### Planner

- Santa Clara County Green Building Ordinance
- New homes are required to be GreenPoint Rated. Non-residential projects affecting over 1,000 sq ft in area required to comply with applicable measures on Stopwaste.Org Small Commercial Green Building Checklist. City-sponsored and Public/Private partnership projects over \$3million required to be LEED Silver. [http://qcode.us/codes/unioncity/view.php?topic=15-15\\_76&showAll=1&frames=on](http://qcode.us/codes/unioncity/view.php?topic=15-15_76&showAll=1&frames=on)
- Do allow a nationally or regionally recognized rating system, such as LEED.
- Green Building Code
- Green Building Ordinance requires LEED Gold for all new construction and renovation, and for residential 75 Green Point Rated. Also part of our Environment Code and integrated into the Building Code.
- Yes, the BERST model ordinance which relies mandates Green Point Rated or LEED compliance



### RC.3 Does your city or county have an Energy Ordinance?

Answer Options	Sum	%	P
<b>Total</b>	<b>8</b>	<b>100%</b>	<b>8</b>
No	5	56%	5
Yes (Specify in comment box)	2	22%	2
I don't know	1	11%	1

#### Comments:

##### Planner

- Residential time-of-sale ordinance (RECO) requiring attic insulation and other cost-effective energy and water efficiency measures

### RC.4 Does your jurisdiction plan to pursue any of the following approaches in 2014, in addition to the 2013 Energy Code requirements? Please check all that apply.\*

Answer Options	Sum	%	CBO	P
<b>Total</b>	<b>30</b>	<b>100%</b>	<b>21</b>	<b>9</b>
I don't know	9	30%	5	4
Other (Specify in comment box)	8	27%	7	1
Cal Green Tier I	5	17%	3	2
Green Building Ordinance	5	17%	4	1
Cal Green Tier II	3	10%	2	1

#### Comments:

##### Chief Building Official

- Green Building Ordinance req. BIG or LEED or equivalent, pending cost effective study
- After verifying cost effective study
- No (2)
- We are adopting the body of the code with Tier 1 and Tier 2 as voluntary measures
- Under consideration by City Council
- Enforcement of CALGreen
- The City of Dublin has had a Green Building Ordinance in place since 2009 and Green Measures in place since 1999
- No--We are enforcing the minimum standards of the codes, but recommending a Tier 1 or 2 approach.

- No. The requirements of the State Code are sufficient.
- NONE. CALGreen basic only

##### Planner

- The specifics will be known by the end of the year
- We are waiting for more information from Build It Green and Stopwaste.Org regarding updated rating systems and cost effectiveness.
- Energy only.
- Other: amending an existing residential time-of-sale ordinance to improve home energy performance
- Potentially. The process is very screwed up since the process isn't even in place to prepare the cost effectiveness studies for going above base Cal Green.

### RC.5 How does your jurisdiction enforce and gauge the effectiveness of existing Green Building and other Reach Codes?

Answer Options	Sum	P
<b>Total</b>	<b>7</b>	<b>7</b>
Open-Ended Response	7	7

#### Responses:

##### Planner

- Building staff plan checks and inspects the buildings
- Don't know
- Our Building Official requires compliance to be documented through permit issuance and inspection process. Certification through Build It Green and LEED

required for applicable projects prior to final approval/certificate of occupancy.

- We have certified staff.
- We required that a certified rater be used.
- Work with Dept of Building Inspection.
- Through contract inspectors.

**RC.6 If so, are any changes planned for 2014? If not, is your agency planning on implementing standards in 2014?**

Answer Options	Sum	P
<b>Total</b>	<b>7</b>	<b>7</b>
Open-Ended Response	7	7

**Responses:**

**Planner**

- Not sure yet.
- We are waiting for more information from Build It Green and Stopwaste.Org regarding updated rating systems and cost effectiveness.
- No changes in 2014. We will be implementing existing standards in 2014.
- None in Planning.
- Yes, CALGreen, amending the RECO mentioned above, and a Solar/EV ordinance.
- Unlikely. Action Plan to be adopted in 2014 with programs to be completed during the next 20-years.
- Again, we're awaiting the ability to prepare a cost effectiveness stud

**RC.7 When reviewing proposed development projects, do you apply any special requirements or conditions to optimize building energy efficiency? If so, please explain.**

Answer Options	Sum	P
<b>Total</b>	<b>5</b>	<b>5</b>
Open-Ended Response	5	5

**Responses:**

**Planner**

- Standard template condition - Compliance with County Green Building Ordinance
- Requirements listed in Stopwaste.Org Small Commercial Green Building Checklist and GreenPoint Rated checklist.
- No additional requirements. (2)
- New developments are pushed to high LEED ND standard through negotiation with Mayor's Office, Board of Supervisors, Planning, and Environment depts. Individual buildings must follow the current LEED Gold requirement that includes 15% better than Title 2

**Commercial Envelope**

**CE.1 For commercial buildings with low-sloped roofs, how often are cool roofs installed?**

Answer Options	Sum	BI
<b>Total</b>	<b>35</b>	<b>35</b>
<b>Re-roofing</b>		
Sometimes 1-33%	7	7
Usually 67-100%	6	6
Often 34-66%	4	4
I don't know	0	0
<b>New Construction</b>		
Usually 67-100%	9	9
Sometimes 1-33%	7	7
I don't know	1	1
Often 34-66%	1	1

**Comments:**

**Building Inspector**

- We are in climate zone 2
- No new commercial building built for a long time.
- ENV-1A Is No Longer Used And Has Been Deleted ... ENV-1C Is Required At Building Final

**CE.2 How often do applications for re-roofing of commercial buildings with low-sloped roofs specify cool roofing?**

Answer Options	Sum	PE
<b>Total</b>	<b>20</b>	<b>20</b>
Sometimes 1-33%	11	11
Usually 67-100%	4	4
Often 34-66%	3	3
I don't know	2	2

**Comments:**

**Plans Examiner**

- Seldom

**CE.3 How often do your commercial re-roof plans specify cool roofing?**

Answer Options	Sum	%	D
<b>Total</b>	<b>10</b>	<b>100%</b>	<b>10</b>
Usually 67-100%	4	40%	4
Sometimes 1-33%	3	30%	3
N/A	1	10%	1
Often 34-66%	1	10%	1
Never	0	0%	0

**Comments:**

**Designer**

- Always.

**CE.4 How often do your re-roof jobs on commercial buildings with low-sloped roofs specify cool roofing?**

Answer Options	Sum	%	C
<b>Total</b>	<b>3</b>	<b>100%</b>	<b>3</b>
Never	2	67%	2
N/A	1	33%	1
Often 34-66%	0	0%	0
Sometimes 1-33%	0	0%	0
Usually 67-100%	0	0%	0

**CE.5 How often does the compliance documentation for new commercial buildings with low-sloped roofs specify cool roofing?**

Answer Options	Sum	%	PE
<b>Total</b>	<b>19</b>	<b>100%</b>	<b>19</b>
Sometimes 1-33%	9	47%	9
I don't know	4	21%	4
Usually 67-100%	4	21%	4
Often 34-66%	2	11%	2

**Comments:**

**Plans Examiner**

- Project using Performance Approach Envelope compliance, cool roof may not be required.
- This is a standard correction item addressed in the first round of correction comments.
- Seldom

## Residential Envelope

### RE.1 During your rough framing inspection of residential projects, how often is insulation installed in exterior walls behind a tub/shower?

Answer Options	Sum	BI
<b>Total</b>	<b>43</b>	<b>43</b>
<b>Additions &amp; Alterations</b>		
Usually 67-100%	12	12
N/A	3	3
Sometimes 1-33%	3	3
I don't know	1	1
Often 34-66%	1	1
<b>New Construction</b>		
Usually 67-100%	15	15
Sometimes 1-33%	3	3
N/A	2	2
Often 34-66%	2	2
I don't know	1	1

#### Comments:

##### **Building Inspector**

- Requirement
- We have a separate insulation inspection
- 100%
- The Exterior Wall Insulation Inspection Is A Separate Inspection - "After Rough Frame / All Trades".

### RE.2 For residential projects, how often do envelope (walls, floor, ceiling) insulation R-values on the compliance documentation match those on the plans?

Answer Options	Sum	%	PE
<b>Total</b>	<b>24</b>	<b>100%</b>	<b>24</b>
Usually 67-100%	12	50%	12
Often 34-66%	10	42%	10
I don't know	2	8%	2
Sometimes 1-33%	0	0%	0

#### Comments:

##### **Plans Examiner**

- I would estimate the design performance is more like 95% for Marin, allowing for error. We have both an energy ordinance and a green ordinance which is more restrictive than T-24. As a result we are very attentive to these issues during plan review.

### RE.3 How often do you see radiant barriers installed in residential attics?

Answer Options	Sum	BI
<b>Total</b>	<b>47</b>	<b>47</b>
<b>Re-roofing</b>		
Sometimes 1-33%	14	14
Never	5	5
N/A	2	2
Often 34-66%	2	2
Usually 67-100%	0	0
<b>New Construction</b>		
Sometimes 1-33%	10	10
Often 34-66%	6	6
Usually 67-100%	6	6
N/A	1	1
Never	1	1

#### Comments:

##### **Building Inspector**

- We only do finals from the exterior.

### RE.4 How often does residential compliance documentation specify attic radiant barriers?

Answer Options	Sum	PE
<b>Total</b>	<b>45</b>	<b>45</b>
<b>Additions &amp; Alterations</b>		
Sometimes 1-33%	15	15
Often 34-66%	4	4
I don't know	2	2
Usually 67-100%	2	2
<b>New Construction</b>		
Sometimes 1-33%	11	11
Often 34-66%	5	5
I don't know	3	3
Usually 67-100%	3	3

#### Comments:

##### **Plans Examiner**

- Very seldom

## Commercial Lighting

### CL.1 For commercial projects, how often is adequate documentation provided to demonstrate compliance with outdoor lighting requirements?

Answer Options	Sum	%	PE
<b>Total</b>	<b>20</b>	<b>100%</b>	<b>20</b>
Often 34-66%	9	45%	9
Usually 67-100%	7	35%	7
Sometimes 1-33%	3	15%	3
I don't know	1	5%	1

### CL.2 For retail lighting designs, how often are display lights called out separately on the plans?

Answer Options	Sum	%	PE	C
<b>Total</b>	<b>23</b>	<b>100%</b>	<b>20</b>	<b>3</b>
Sometimes 1-33%	7	30%	6	1
Usually 67-100%	7	30%	7	0
Often 34-66%	6	26%	6	0
I don't know	1	4%	1	0
N/A	1	4%	0	1
Never	1	4%	0	1

#### Comments:

##### *Plans Examiner*

- Display lighting is typically difficult to distinguish on the plans

### CL.3 For retail lighting designs, how often do your plans call out display lights separately?

Answer Options	Sum	%	D
<b>Total</b>	<b>9</b>	<b>100%</b>	<b>9</b>
Usually 67-100%	4	44%	4
N/A	3	33%	3
Never	1	11%	1
Sometimes 1-33%	1	11%	1
Often 34-66%	0	0%	0

#### Comments:

##### *Designer*

- I may have done a few retail project, but the display lighting was not specified as installed.

### CL.4 For retail tenant improvements, how often do you install demand responsive lighting controls?

Answer Options	Sum	%	C
<b>Total</b>	<b>3</b>	<b>100%</b>	<b>3</b>
N/A	1	33%	1
Often 34-66%	1	33%	1
Sometimes 1-33%	1	33%	1
Never	0	0%	0
Usually 67-100%	0	0%	0

**CL.5 For retail tenant improvements, how often do you specify demand responsive lighting controls?**

Answer Options	Sum	%	D
<b>Total</b>	<b>9</b>	<b>100%</b>	<b>9</b>
N/A	2	22%	2
Never	2	22%	2
Sometimes 1-33%	2	22%	2
Usually 67-100%	2	22%	2
Often 34-66%	1	11%	1

**Residential Lighting**

**RL.1 How often do you include a lighting layout and schedule on residential plan submittals?**

Answer Options	Sum	%	C
<b>Total</b>	<b>9</b>	<b>100%</b>	<b>9</b>
Sometimes 1-33%	4	44%	4
Usually 67-100%	2	22%	2
N/A	1	11%	1
Never	1	11%	1
Often 34-66%	1	11%	1

**RL.2 How often do you include Energy Code lighting requirements on the electrical and lighting plans?**

Answer Options	Sum	%	D
<b>Total</b>	<b>8</b>	<b>100%</b>	<b>8</b>
Usually 67-100%	5	63%	5
Often 34-66%	3	38%	3
Never	0	0%	0
Sometimes 1-33%	0	0%	0

**RL.3 How often do you see a lighting layout and schedule on residential plan submittals?**

Answer Options	Sum	%	PE
<b>Total</b>	<b>25</b>	<b>100%</b>	<b>25</b>
Usually 67-100%	10	40%	10
Often 34-66%	9	36%	9
Sometimes 1-33%	6	24%	6
I don't know	0	0%	0

**RL.4 In new homes, how often do you see "manual on" occupancy sensors installed in bathrooms that have low-efficacy lighting?**

Answer Options	Sum	%	BI
<b>Total</b>	<b>23</b>	<b>100%</b>	<b>23</b>
Usually 67-100%	11	48%	11
Sometimes 1-33%	8	35%	8
Often 34-66%	3	13%	3
I don't know	1	4%	1

**Comments:**

**Building Inspector**

- Requirement for Final
- We also see alternatives.
- It's in the package handed to the owner at final
- 100%
- Required @ Building Final / Sign-Off

**RL.5 With low-efficacy outdoor lighting, how often are photo control or astronomical time switches installed?**

Answer Options	Sum	%	BI
<b>Total</b>	<b>23</b>	<b>100%</b>	<b>23</b>
Usually 67-100%	12	52%	12
Sometimes 1-33%	11	48%	11
I don't know	0	0%	0
Often 34-66%	0	0%	0

**Comments:**

**Building Inspector**

- Motion with photo over ride required
- 100%
- Required @ Building Final / Sign-Off

**Commercial Mechanical**

**CM.1 How often do commercial plan submittals specify proper thermostatic controls for space heating and cooling?**

Answer Options	Sum	%	PE
<b>Total</b>	<b>20</b>	<b>100%</b>	<b>20</b>
Often 34-66%	9	45%	9
Usually 67-100%	5	25%	5
Sometimes 1-33%	4	20%	4
I don't know	2	10%	2



## CM.2 How often do you include mechanical control sequence specifications on your commercial projects?

Answer Options	Sum	%	C	D
<b>Total</b>	<b>11</b>	<b>100%</b>	<b>3</b>	<b>8</b>
Never	3	27%	1	2
Sometimes 1-33%	3	27%	0	3
Often 34-66%	2	18%	0	2
Usually 67-100%	2	18%	1	1

### Comments:

#### Contractor

- When we do the design in house we do this but most commercial jobs are designed by outside mechanical design firms. This is a big problem for us because we end up re-designing the controls

#### Designer

- Mainly automatic thermostat setback and turn-on.
- I am not sure that we ever do this

## Residential Mechanical

### RM.1 Do you require that residential heating & cooling equipment efficiencies be specified on the plans?

Answer Options	Sum	%	PE
<b>Total</b>	<b>24</b>	<b>100%</b>	<b>24</b>
Yes	16	67%	16
No	8	33%	8

### Comments:

#### Plans Examiner

- It is specified on the t-24 print out
- But if that is about the only correction needed, we will accept that it is on the energy report and CALGreen checklist in-lieu of revising the plans.

- If high efficiency equipment is indicated in the Title-24, it is asked to be put on the plans. Standard efficiency equipment is not always required to indicate on plans.
- We do require CF-1R and MF-1R be copied onto and made a part of the plans.

### RM.2 For residential hot water recirculation systems, how often is pipe insulation specified on the plans?

Answer Options	Sum	%	PE
<b>Total</b>	<b>25</b>	<b>100%</b>	<b>25</b>
Sometimes 1-33%	10	40%	10
I don't know	5	20%	5
Often 34-66%	5	20%	5
Usually 67-100%	5	20%	5

### Comments:

#### Plans Examiner

- We see very few projects that use recirculation. (2)

### RM.3 How often are tankless water heaters specified on residential plans?

Answer Options	Sum	PE
<b>Total</b>	<b>46</b>	<b>46</b>
<b>Additions &amp; Alterations</b>		
Often 34-66%	11	11
Sometimes 1-33%	10	10
Usually 67-100%	2	2
I don't know	2	2
<b>New Construction</b>		
Often 34-66%	12	12
Sometimes 1-33%	6	6
I don't know	2	2
Usually 67-100%	2	2

### RM.4 How often do residential plan submittals include room by room heating & cooling loads?

Answer Options	Sum	%	PE
<b>Total</b>	<b>25</b>	<b>100%</b>	<b>25</b>
Sometimes 1-33%	15	60%	15
I don't know	6	24%	6
Often 34-66%	2	8%	2
Usually 67-100%	2	8%	2

#### Comments:

##### *Plans Examiner*

- Very seldom
- None of the plans.

### RM.5 How often do residential plan submittals indicate the volume and efficiency or make and model of gas storage water heating equipment?

Answer Options	Sum	%	PE
<b>Total</b>	<b>25</b>	<b>100%</b>	<b>25</b>
Sometimes 1-33%	13	52%	13
Often 34-66%	5	20%	5
Usually 67-100%	5	20%	5
I don't know	2	8%	2

**RM.6 How often do you include room by room heating and cooling load calculations in your residential plan submittals?**

Answer Options	Sum	%	C	D
<b>Total</b>	<b>17</b>	<b>100%</b>	<b>9</b>	<b>8</b>
Never	6	35%	1	5
Usually 67-100%	4	24%	2	2
Sometimes 1-33%	3	18%	3	0
Often 34-66%	2	12%	1	1

**Comments:**

**Contractor**

- Always preform them but rarely turn over to any building departments unless it's a commercial system. Commercial system is 100%

**Designer**

- Not a part of architectural, but likely in the T-24 report.

**RM.7 How often do you specify heating & cooling equipment efficiencies in your residential plan submittals?**

Answer Options	Sum	%	C	D
<b>Total</b>	<b>17</b>	<b>100%</b>	<b>9</b>	<b>8</b>
Usually 67-100%	11	65%	5	6
N/A	2	12%	2	0
Often 34-66%	2	12%	1	1
Sometimes 1-33%	2	12%	1	1
Never	0	0%	0	0

**RM.8 How often do your residential plan sets specify the model number or volume and efficiency of gas water heaters?**

Answer Options	Sum	%	C	D
<b>Total</b>	<b>15</b>	<b>100%</b>	<b>8</b>	<b>7</b>
Usually 67-100%	6	40%	1	5
Sometimes 1-33%	5	33%	5	0
Often 34-66%	3	20%	1	2
N/A	1	7%	1	0
Never	0	0%	0	0

**RM.9 When compliance documentation requires pipe insulation, do you specify it on your plans?**

Answer Options	Sum	%	D
<b>Total</b>	<b>8</b>	<b>100%</b>	<b>8</b>
Yes	7	88%	7
No	1	13%	1

**RM.10 When compliance documentation requires pipe insulation, how often is it specified on the plans**

Answer Options	Sum	%	PE	C
<b>Total</b>	<b>33</b>	<b>100%</b>	<b>24</b>	<b>9</b>
Sometimes 1-33%	14	42%	10	4
Often 34-66%	8	24%	8	0
Usually 67-100%	5	15%	4	1
I don't know	2	6%	2	0

**Comments:**

**Plans Examiner**

- None

**Contractor**

- If you the T24 is printed on the plan sets then it there.

**RM.11 When your residential designs include a hot water recirculation pump, do you specify pipe insulation?**

Answer Options	Sum	%	D
<b>Total</b>	<b>7</b>	<b>100%</b>	<b>7</b>
Yes	7	100%	7
No	0	0%	0

**Comments:**

**Plans Examiner**

- Haven't used a HW recirculation pump before - would not recommend them to clients but if one wanted then I would rec insulating pipes. Would recommend an on-demand recirculation pump or the kind that sends cold water in HW line back to tank (can't think of name...)

## Appendix B: Description of Roles of Survey Participants

### City and County Staff

#### **Chief Building Official (CBO)**

This is a senior, administrative, public-facing, supervisory, leadership position whose responsibilities include managing building department activities within the broader context of city and/or county government. Building officials work at the policy level with the City Council or Board of Supervisors to ensure that the client experience at the building department is satisfactory. To that end he or she advises on permit process and classification including interpreting what types of permits are required, assigning fees to permits, permit review and inspection turn-around time and other issues. There is only one Chief Building Official per jurisdiction. It generally requires:

- Certification by the ICC (International Code Council) as a Building Official and Building Inspector OR licensure by the State of California as a civil engineer, structural engineer, or architect, and
- A degree in structural engineering, construction management, architecture, or related field, and
- Experience in plan checking and building inspection.

#### **Permit Technician**

This is an administrative, customer-facing position whose responsibilities include managing permit application payments and receipts, computer data entry, fielding customer questions, resolving complaints, and verifying that all necessary documentation is provided with each permit application before accepting and forwarding the application to other building department staff for technical review.

#### **Plans Examiner**

This technical position requires extensive knowledge of local, state, and federal building codes and ordinances, including electrical, mechanical, plumbing, energy, historical, fire, and green building. It involves reviewing permit applications for the documentation needed to determine whether proposed building activity meets minimum code requirements. Typical qualifications are a Bachelor's degree in Civil or Structural Engineering or related field, and three years professional engineering experience. When assessing compliance with the CA Energy Code, plans examiners focus on Parts 3-5 of the CF-1R.

#### **Building Inspector**

This is a senior, technical, customer-facing leadership position which generally requires ICC Certification as a Building Inspector, and whose responsibilities typically include:

- All those of a permit technician and plans examiner,
- Providing detailed information and answers to questions about building codes and standards,
- Field inspection of building activity to ensure compliance with the approved permit.

When assessing compliance with the CA Energy Code, field inspectors focus on Parts 1-2 of the CF-1R.

#### **Planner**

Our intent here is to identify the individuals most directly involved in developing and influencing local government policy toward improving building energy efficiency and reducing greenhouse gas emissions by improving compliance with Energy, Green Building, and Reach Codes. Though not directly involved with code enforcement, they are in the best position to assist building department staff with technical issues, plan review, training needs, and understanding why and how to enforce energy code measures.

### Permit Applicants

#### **Designers**

The building designer may be an architect, engineer or other California-licensed professional, though a licensed design professional is not always required to obtain a building permit. With respect to Energy Code compliance, the designer is the person who signs the "Responsible Building Designer's Declaration Statement" at the end of the residential CF-1R form. By doing so, the designer accepts responsibility for ensuring that the documentation provided in the permit application conforms to the Energy Code.

## ***Contractors***

Contractors are licensed by the CSLB (CA State Licensing Board) to perform building activities within their license category. These include B-licensed general contractors (typically “builders” for new construction, or “remodelers” for existing buildings), or specialized (electrical, mechanical, plumbing, roofing, or other) contractors. For new production homes, the builder may also be the developer. Especially for building alterations, a contractor may be the building designer and permit applicant.

## ***Energy Consultants***

Energy consultants use CEC-approved software to determine building compliance with the Energy Code when the performance (vs. prescriptive) method is used, and they sign the “Documentation Author’s Declaration Statement” at the end of the residential CF-1R form. The CA Association of Building Energy Consultants (CABEC) offers training and certification in two categories – CEA (Certified Energy Analyst) and CEPE (Certified Energy Plans Examiner), but energy consultants do not have to be CABEC certified.