

Tri-County Regional Energy Network
(3C-REN)

2019 Market Needs Assessment:
Codes & Standards and Workforce,
Education & Training

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1.0 Overview

The Tri-County Regional Energy Network (3C-REN) serves the counties of Ventura, Santa Barbara, and San Luis Obispo, aiming to successfully expand and grow energy efficiency services and energy savings in the region. Programs administered by 3C-REN are designed to fill gaps in current Investor-Owned Utility (IOU) offerings for the territory. 3C-REN currently offers three programs:

- Residential Direct Install (Res DI)
- Workforce Education & Training (WE&T)
- Codes & Standards (C&S)

This Market Needs Assessment report is designed to inform 3C-REN program development for the latter two programs, WE&T and C&S. These programs are distinct, but both are designed for building professionals, including private-sector commercial and residential building professionals, public-sector local government staff, and other building industry stakeholders that impact energy efficiency measure uptake. The report aims to capture local feedback from these targeted stakeholders to aid in the development of each program's scope:

- The WE&T program offers career pathways and enrichment needs for local building professionals to increase energy efficiency measure uptake.
- The C&S program offers access to key resources needed for code enforcement and compliance to support energy efficiency measure installation.

To realize these programs, 3C-REN leverages the IOUs' existing statewide classroom and online trainings, and tailors programs to meet local skills gaps through technical, soft skills, and business development trainings reinforced by mentorship. 3C-REN has also established a Code Coach service and project verification support to run alongside other training efforts. The service provides expert on-site, in-field, and remote technical support with the goal of ensuring consistency in code compliance and enforcement, a more stable business climate, and known code resources. This report aims to capture stakeholder feedback that can help refine and inform the development of future 3C-REN WE&T and C&S services.

The report is based on feedback collected during a survey fielded to 3C-REN building professional stakeholders in early 2019. 3C-REN worked with Frontier Energy to develop an online Market Needs Assessment Survey for public and private sector building professionals in the tri-county region. 3C-REN staff also conducted a "roadshow" to promote survey participation and gather further qualitative feedback. The survey collected information needed to identify existing practices and baselines, characterize barriers, establish best practices, and determine training and resource needs.

1.1 Goals

The Market Needs Assessment Survey was designed with objective and subjective questions to inform 3C-REN program development for WE&T and C&S programs by identifying:

- Baseline participant information about 3C-REN stakeholders;
- Existing tools and practices for energy code compliance;
- Barriers to understanding and enforcing energy efficiency measures; and
- Knowledge gaps, training needs and preferences for energy efficiency workforce.
- Current means of identifying permitted and non-permitted energy efficiency activity

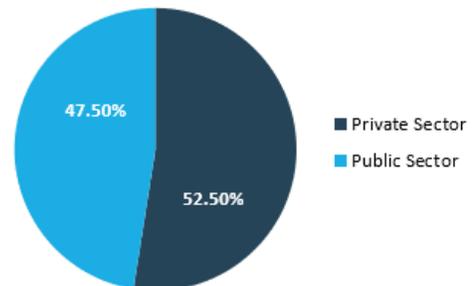
The report is designed to provide a readout on the feedback collected, and recommendations based on these findings to support the development of WE&T and C&S programs in growing energy efficiency services and savings. The stakeholder responses are summarized in [Appendix B: Key Survey Findings](#) and the full set of responses are available in [Appendix E: Survey Response Data](#). The recommendations section includes a list of recommended activities that align with both 3C-REN’s goals for the C&S and WE&T programs, and the feedback received from stakeholders. The recommendations section includes an overview of relevant feedback received, guidance on how to consider implementing a recommendation, and information on how each recommendation aligns with 3C-REN’s goals and schedule as referenced in the sector-level data for the 3C-REN Business Plan metrics, Attachment A Adopted Common Metrics for Energy Efficiency Business Plans, filed August 6, 2018.

1.2 Participants

To gain a comprehensive understanding of needs in the tri-county region, outreach to a wide range of stakeholders was conducted to drive survey participation.

80 total responses were received from the:

- Private Sector (Energy Consultant, Contractor, Designer, or another role)
- Public Sector (Building Inspector, Chief Building Official, Permit Technician, Plans Examiner, Planner, or another role)



All participants work within one or more of the tri-counties, with most in San Luis Obispo and Santa Barbara counties. The survey saw lower participation from stakeholders in Ventura County. For more information about respondents, please see the “Participants” findings section in Appendix B.

1.3 Topic Areas

The Market Needs Assessment Survey is designed to collect information on the following categories relevant to supporting building professionals in growing energy efficiency services and energy savings in the region:

- Barriers to Energy Code Compliance & Energy Measure Adoption
- Building Department Resources for Energy Code Compliance
- CALGreen
- Energy Code Compliance Documentation
- Energy Permit Tracking
- Energy Reach Codes
- Training for Energy Measure Adoption & Code Compliance
- Workforce for Energy Measure Adoption & Code Compliance

Unless otherwise noted, when the report refers to Title 24, this is shorthand for the relevant sections of the code: Part 6 California Energy Code, and Part 11 California Green Building Standards Code (CALGreen). In some instances, data was requested specifically on Title 24 Part 6 or Title 24 Part 11; this is noted accordingly.

Additionally, the survey captured data on Participants and the Survey Process.

1.4 Administration

3C-REN worked with Frontier Energy, the consultant team, to refine topic categories and develop the survey. Each participant was presented with a set of questions most appropriate to their role in the energy code compliance and enforcement process. The survey was promoted by 3C-REN program representatives by both email and in-person visits, and at kick-off “roadshows” that introduced stakeholders to 3C-REN and gathered input on the new program. The survey itself was administered electronically via the Survey Monkey platform, delivered to participants by email during May 6, 2019 – June 10, 2019.

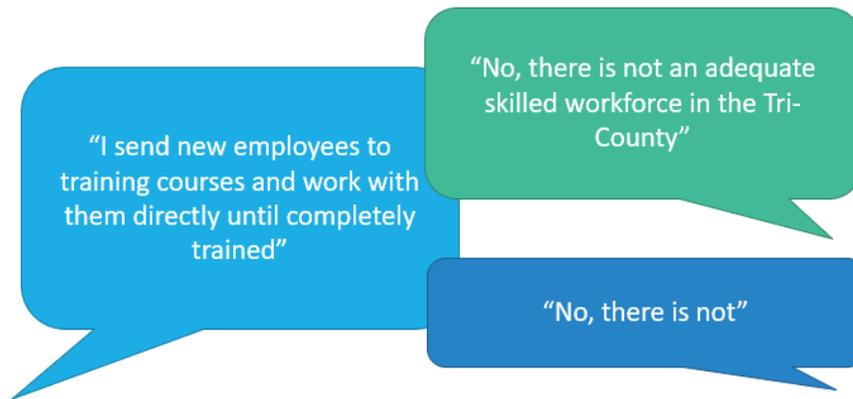
Frontier Energy compiled findings for this report. The survey has been closed, and responses will inform future program activities.

2.0 Key Takeaways

Although the survey found a wide variety of results based on the topics discussed, a handful of key findings stand out that can serve to guide 3C-REN activities in the near future.

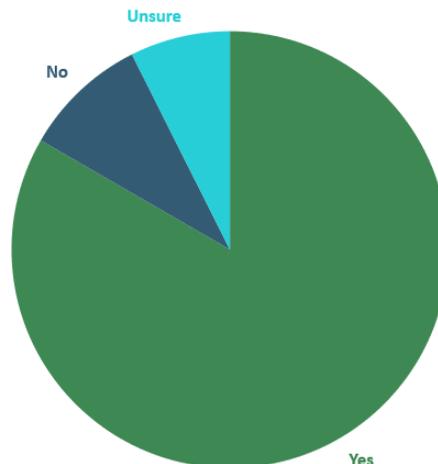
2.1 Our workforce needs training.

Based on written comments, Contractors do not feel there is an adequate skilled workforce in the tri-county area.



2.2 Both the public and private sectors want Energy Code support.

Almost unanimously, both sectors indicated they would use a service providing free support over the counter, online, or through phone and in-field consultations.



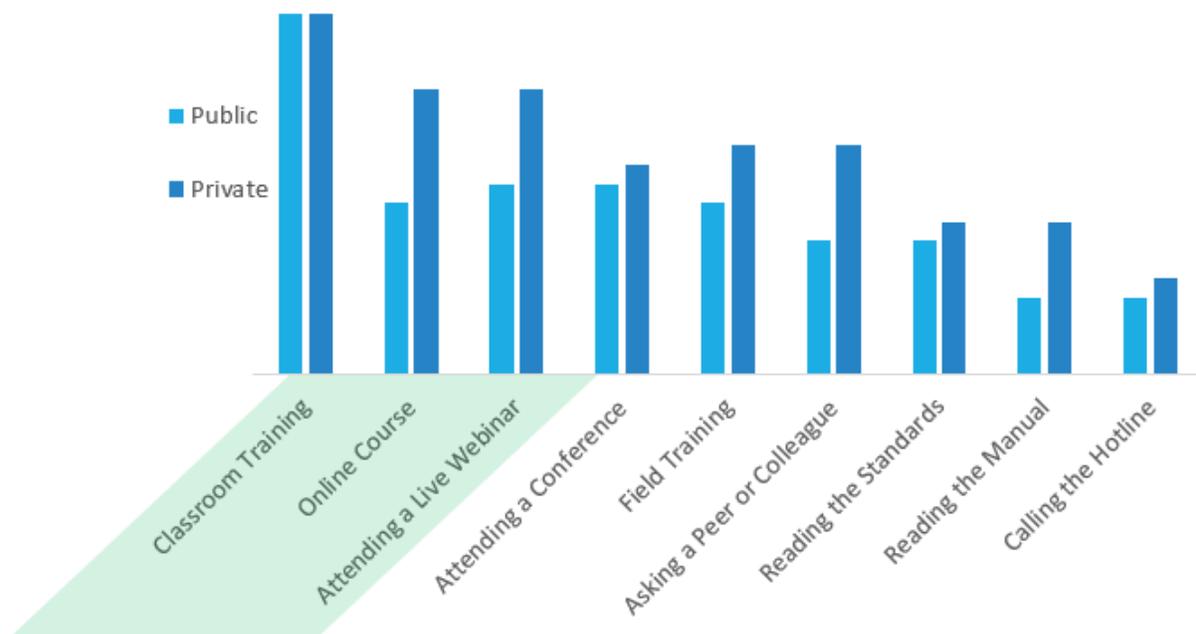
2.3 Training needs vary by audience and sector.

Types of trainings desired, by audience:

	Contractors & Designers	Energy Consultants	Public Sector roles
Mechanical Measures	✓	✓	
Basic Building Science	✓		
Plans & Specifications	✓		✓
Compliance Documentation		✓	
Energy Code Navigation		✓	✓
Title 24 Training			✓
Prescriptive Measure Requirements (Res & Non-Res)			✓

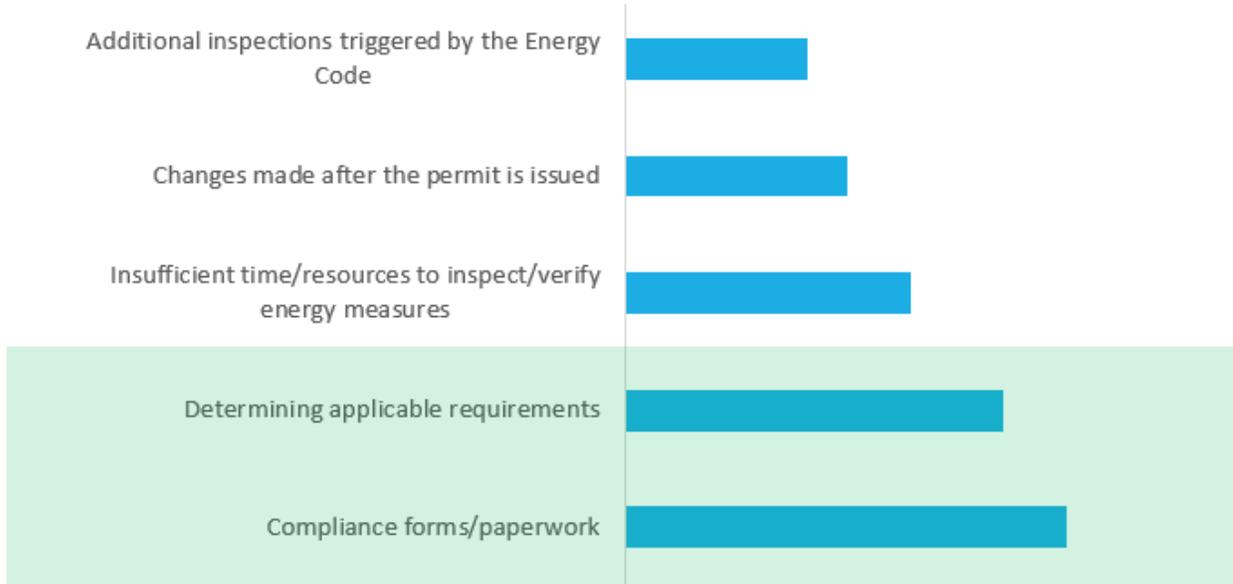
2.4 In person and online trainings are best.

The top three most effective ways to learn new aspects of the energy code include classroom trainings, online courses, and attending live webinars.



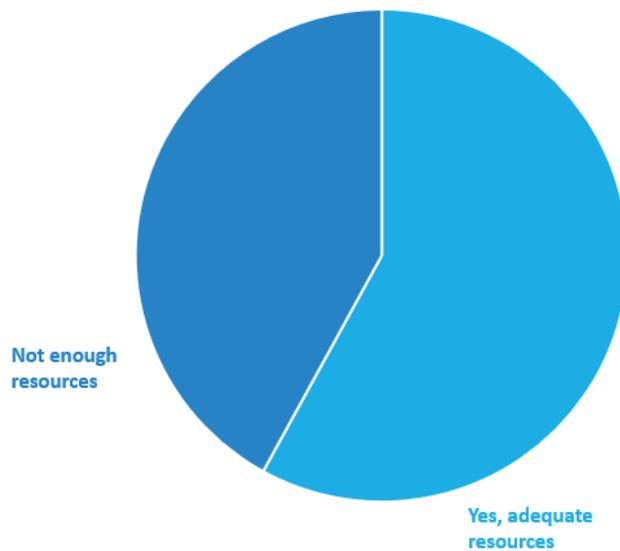
2.5 Compliance paperwork is a barrier.

We found that compliance paperwork and determining applicable requirements is a leading barrier across both public and private sectors.



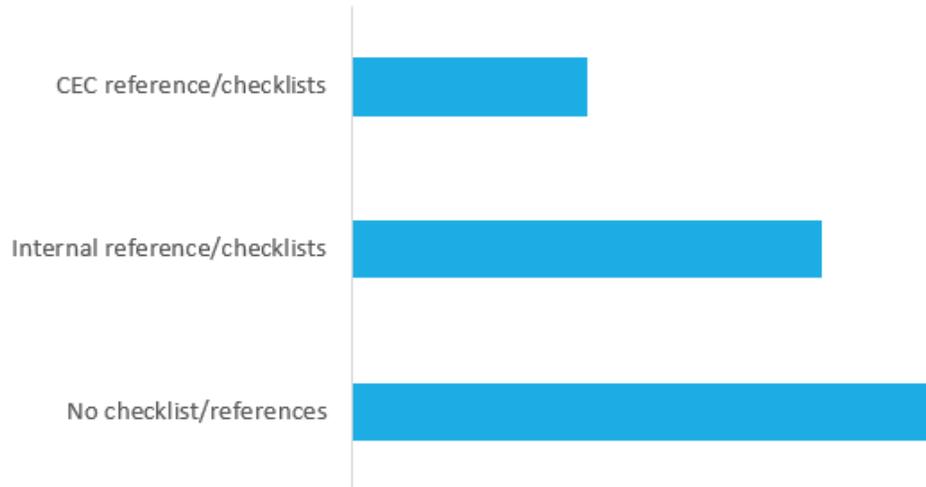
2.6 The public sector lacks resources.

42% of respondents feel their jurisdiction does not have adequate resources to enforce energy code.



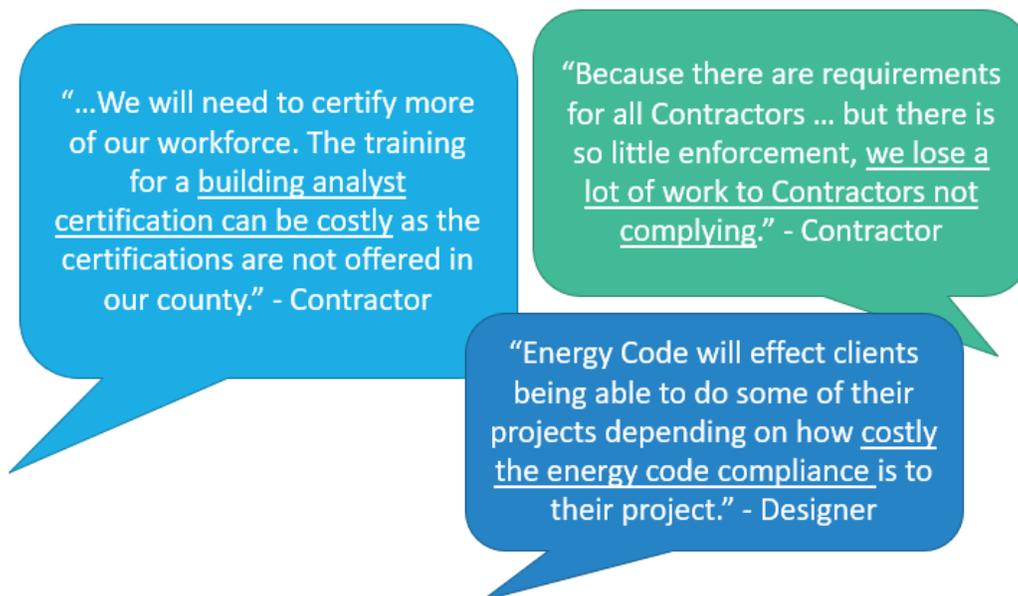
2.7 Different agencies have different tools. The inconsistency causes frustration for both sectors.

We found a wide array of tools that plans examiners and permit technicians used – some used California Energy Commission (CEC)-provided references, some used internally developed checklists, while others were not required to use any type of checklist or reference.



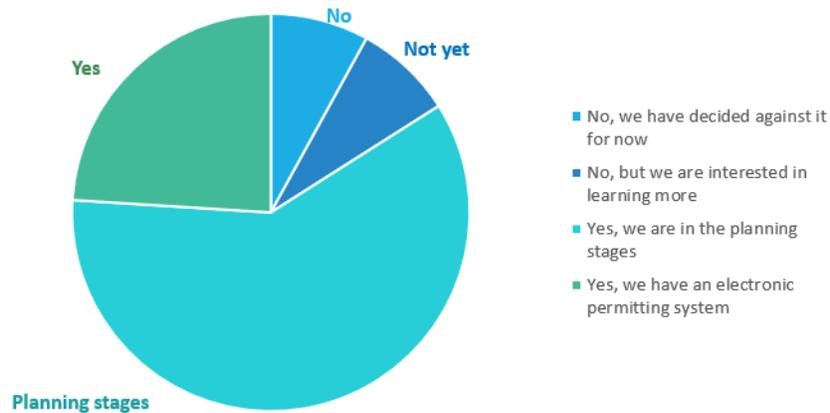
2.8 The private sector has the perception that Energy Code compliance and reach codes increase project costs.

If we can help customers gain education and awareness about Title 24, we hope to shift the perception of code from being a hurdle, to simply being part of the process.



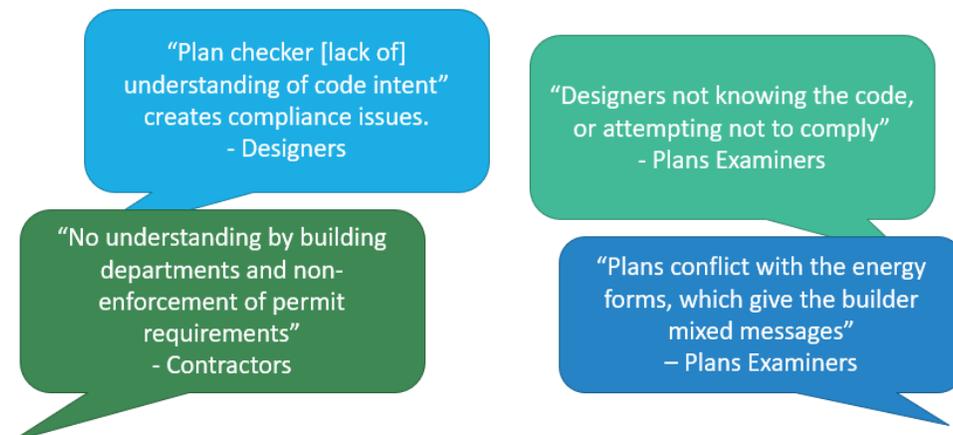
2.9 It might be challenging to track progress in helping with energy code enforcement.

Only 27% of responding agencies already have electronic permitting in place. 77% of departments do not have a mechanism for tracking energy code measures.



2.10 We can improve coordination and communication between public & private sectors.

Both public & private sector stakeholder groups provided feedback that one of their major barriers to code compliance or enforcement is perceived to be the other stakeholder group. (Below are quotes from both groups on barriers and challenges.) This suggests that some barriers arise from how these sometimes-siloed stakeholder groups work together, and that there's an opportunity to reduce barriers to mutual Title 24 compliance goals by increasing mutual understanding. 3C-REN is uniquely positioned to facilitate improved communications and coordination between the private and public sectors. Its C&S and WE&T programs can drive change in how these groups work together, increasing energy savings achieved in the region.



3.0 Recommendations

This section describes challenges based on the results above and recommends actions to address or mitigate each issue.

The recommendations below were developed to inform how to achieve 3C-REN's goals. These goals include, but are not limited to, the following:

- Identifying existing tools and practices for energy code compliance;
- Developing tools and practices for compliance and application of codes & standards;
- Addressing knowledge gaps, training needs, and preferences; and
- Facilitating agency collaboration and improve regional cooperation to help achieve consistency among jurisdictions and avoid confusion for building professionals.

In-depth recommendations have been provided for those recommendations that closely align with 3C-REN's near-term goals. Ultimately, 3C-REN will select recommendations to incorporate into program and service design based upon program needs, goals, and available resources.

3.1 Participants

Recommendation 3.1.A: When 3C-REN plans to collect stakeholder data in the future, 3C-REN should consider a variety of factors to help increase response rates, or consider alternate data collection methods for stakeholders who have historically had lower response rates.

Overview: Results in this report reflect a high response rate for participants in San Luis Obispo County but less so in Ventura County or Santa Barbara County. Audiences for surveys of all types are more likely to respond when the survey is distributed by a trusted partner, and when recipients believe that their responses will have some positive impact.

Key Market Actors: Local building departments, training providers, building professionals, trade associations

The How: Assuming future surveys are of a similar length and complexity, 3C-REN should continue to work towards establishing long-term, trusted relationships across the service area to generate a more consistent response rate across counties. Alternately, 3C-REN should consider alternate data collection methods. To establish long-term relationships, BayREN county representatives have found regularly attending International Code Council (ICC) chapter meetings a useful avenue to connect with and engage with building professionals, while also learning about local issues related to Title 24 compliance. These same channels have also highlighted that for some stakeholders, such as Chief Building Officials (CBOs), a survey is more likely to be ignored – it's better to collect feedback one-on-one or face-to-face. 3C-REN can also leverage the Energy Code Coach service, trainings, and forums to help both initiate new relationships as well as bring value to existing relationships. Finally, 3C-REN can consider

incorporating ongoing feedback mechanisms into its standard post-event surveys, leveraging the “captive” audience of event attendees to collect intelligence on targeting stakeholders.

It’s also important to communicate survey findings back to these stakeholders. Demonstrating that survey responses have and will continue to inform 3C-REN activities will affirm that it is worth a stakeholder’s time to provide input on future surveys.

Alignment with 3C-REN Goals:

- Overarching REN goals and criteria: Offering program services that are not duplicative of IOU programs.
- Penetration of trainings: Number of participants by sector (indirectly).
- Penetration of trainings: Percent of participation relative to eligible target population for curriculum (indirectly).
- Penetration of technical forums: Number of participants (indirectly).
- Penetration of forums: Percent of participation relative to target audience.
- Diversity of participants: Percent of total WE&T training program participants that meet the definition of disadvantaged worker (indirectly).

Schedule: Short Term: 2019-2020

Example of Recommended Solution: BayREN works with a diverse group of stakeholders, including local government staff, building professionals, and Bay Area ICC chapters, to provide resources related to energy efficiency policy and code compliance. BayREN Codes & Standards 2016 Annual Report (See Appendix D.2 for details.)

Recommendation 3.1.B: Work in coordination with designer and contractor associations to strengthen relationships. Leverage those relationships to identify and or develop, promote, and evolve stakeholder-driven trainings and resources for the most common project types, with an emphasis on exceeding minimum efficiency requirements.

Overview: Although this survey did not aim to identify in-depth findings on specific project types for which contractors and designers require more support, it did highlight that some project types are more common than others. The responding contractors and designers indicated that they pull permits more commonly for envelope and water heating measures, as well as remodels, than for Heating, Ventilation and Air Conditioning (HVAC) or mechanical change-outs. This generally aligns with statewide data supporting that many HVAC change-out projects are unpermitted. However, the survey participant pool was limited in certain geographies and for certain roles, so may not have been fully representative. Additional research should be conducted to understand actual permitting rates by project type and geography. This can then be used to develop resources and tools to support permitting, compliance, and C&S implementation for the most common project types.

Key Market Actors: Local building departments, building professionals, trade associations

The How: 3C-REN should continue its work to establish regular, ongoing communications with targeted stakeholder groups, with a focus on designers and contractors. By strengthening its two-way communication channels with these stakeholders, 3C-REN will be able to gather more detailed and representative data to guide future program choices. For example, by regularly participating in-person at ICC chapter meetings and other industry groups, 3C-REN will become a more trusted partner. It can then use these relationships to solicit valuable data to shape training topics, and drive engagement and participation in those trainings.

3C-REN should also work with collaborating local building departments to compile data on permit activity for projects that trigger energy code compliance, using either publicly available permit data or data shared with 3C-REN directly from the building department. Data points including pulled permits and finalized permits could then be compared to project volume expected based on building type and measure life expectancy. 3C-REN can use information on common permit types being pulled, as well as project types that require a permit but typically go unpermitted, to inform program activities. This information can then be used to drive stakeholders to go above & beyond minimum efficiency requirements for these projects.

Alignment with 3C-REN Goals:

- Penetration of trainings: Number of participants by sector (indirectly).
- Penetration of trainings: Percent of participation relative to eligible target population for curriculum (indirectly).
- Diversity of participants: Percent of total WE&T training program participants that meet the definition of disadvantaged worker (indirectly).
- Compliance Improvements: Increase in code compliance knowledge pre/post training
- Compliance Improvements: The percentage increase in closed permits for building projects triggering energy code compliance within participating jurisdictions (indirectly).

Schedule: Short Term: 2019-2020

Example of Recommended Solution: BayREN Codes & Standards 2016 Annual Report (See Appendix D.2 for details.)

3.2 Barriers

Recommendation 3.2.A: 3CREN should act as a facilitator to drive awareness of the benefits, importance and legal necessity of Title 24 compliance.

Overview: Title 24 compliance is perceived as optional, costly and time intensive for all parties. Building owners find an issue with compliance costs (HERS, permit, and inspection fees), and building professionals, specifically those in the private sector, are under the impression that achieving compliance requires they take time from their busy schedule to attend trainings and acquire and maintain new skill sets that customers are not demanding even if those skills may

be required by Title 24. 3C-REN is uniquely positioned to design and implement knowledge transfer activities, such as trainings, to improve Title 24 compliance and closeout a permit.

Key Market Actors: Building department staff, building professionals, building owners, permit applicants, training providers including utilities and trade associations

The How: 3C-REN should facilitate its stakeholders to shift their mindsets around Title 24 compliance. To do this, 3C-REN can engage CBOs to create messaging guidelines unique to key market actors about the importance, benefits, and legality of Title 24 compliance, with a heavy focus on educating the permit applicant as to the value of compliance. To promulgate the messaging, in coordination with local jurisdictions, community organizations, and business groups, create handouts, posters, webpages, press releases, and blurbs to include in newsletters, training materials, and applications for business licenses, permits and rebates. Messaging could align with and reinforce code compliance issues and information delivered through trainings, forums, and Energy Code Coach activities and indirectly increase permitting rates for building projects triggering energy code compliance within participating jurisdictions. By generating awareness of the benefits of Title 24 compliance, 3C-REN can shift market actor perceptions away from seeing Title 24 as a burden, and toward seeing it as a critical component of smart building practices.

Alignment with 3C-REN Goals:

- Regional Consistency: Develop and promote consistent messaging across 3C-REN territory that is locally tuned and promotes the value of code compliance.
- Compliance Improvements: Increase in code compliance knowledge pre/post training (indirectly).
- Compliance Improvements: The percentage increase in closed permits for building projects triggering energy code compliance within participating jurisdictions (indirectly).

Schedule: Short Term: 2019-2020

Example of Recommended Solution: While the CEC and the IOUs have developed various Title 24 compliance resources and tools (e.g. fact sheets, FAQ, YouTube videos, handouts, etc.), lack of understanding, lack of access to information, or the perception of false information in the market continues to be a compliance barrier according to survey comments. Although regional examples for this recommended solution are not available, the team may look to other general public education campaigns as a model.

Recommendation 3.2.B: Promote the Energy Code Coach service as comprehensive provider of Title 24 assistance and support.

Overview: Market actors perceive that building departments regularly misinterpret Title 24 and enforce Title 24 inconsistently, which reduces actors' interest and motivation to get Title 24 compliance right. (Please note that survey data captures market actor perceptions, not actual

project data.) Due to the complexity of code requirements and sometimes limited resources to prioritize Title 24 review, building departments are put into a challenging position which can lead to perceived inconsistencies in enforcement.

Key Market Actors: Building department staff, building professionals, building owners, permit applicants

The How: To help bring consistency and reduce the burden of interpretation, a single Energy Code Coach could act as a resource to both agencies and private sector stakeholders. Rather than forcing building department staff to retain comprehensive knowledge of Title 24 or spend a significant amount of time navigating the CEC and Energy Code Ace website researching a question on Title 24 compliance, the Energy Code Coach service can reduce building department burden by offering market actors free and efficient Title 24 assistance – whether remotely, at a building department counter, or in the field. Simultaneously, if building departments have enough time, they can leverage that Energy Code Coach expertise to increase internal staff understanding of Title 24, including up-to-date information on the reasons for and requirements of code updates. An added benefit is knowing the advice provided across jurisdictions will encourage consistent interpretation of the code, compliance, and enforcement.

Alignment with 3C-REN Goals:

- Compliance Improvements: Number of jurisdictions receiving Energy Policy technical assistance.
- Compliance Improvements: Percent of jurisdictions receiving Energy Policy technical assistance.

Schedule: Short Term: 2019-2020

Example of Recommended Solution: The Statewide IOU funded Energy Code Ace program is the closest example. Codes and Standards Compliance Improvement Program 2013-14 (See Appendix D.2 for details.)

3.3 Building Department Resources

Recommendation 3.3.A: Offer tools to enable building department staff to effectively and consistently communicate code requirements to permit applicants.

Overview: Building department staff expressed a need for (better) field tools/resources and technical knowledge to enforce the energy code. Certain project types recommended by Energy Consultants as a priority for enforcement (i.e., HVAC, and water heating) do not cleanly align with priority enforcement areas reported by Plans Examiners (i.e., lighting). 3C-REN in coordination with building professionals and building departments can provide specialized tools

and expertise to ensure enforcement of code requirements in the field, especially for measures deemed most critical and of highest value.

Key Market Actors: Building professionals, building department staff

The How: Identify the compliance and enforcement needs of the community. Specifically, 3C-REN should consider establishing Plans Examiners as critical/central energy champions, and working to facilitate communications between Plans Examiners, Energy Consultants, and Building Inspectors. Working with these key market actors, 3C-REN create a list of measures deemed most critical and of highest value, starting with envelope, fenestration, HVAC and water heating per survey comments. Then, develop, implement and iterate on tools based on those needs and measures. For each measure:

1. Create new or leverage existing tools/resources (avoid duplicating efforts when possible). Tools/resources should be simplistic for Plans Examiners and Building Inspectors to easily identify requirements and triggers.
2. Offer technical support in the field. Tools/resources could reinforce code compliance knowledge pre/post trainings, and participating jurisdictions would receive Energy Policy technical assistance.
3. Integrate tools and best practices for technical field support into applicable trainings. Each training should include well-crafted assessments to improve training delivery overtime. At least 10-20 minutes at the start and end of each class should be reserved to effectively conduct that pre/post assessment.

Alignment with 3C-REN Goals:

- Compliance Improvements: Increase in code compliance knowledge pre/post training.
- Compliance Improvements: Number of jurisdictions receiving Energy Policy technical assistance.
- Compliance Improvements: Percent of jurisdictions receiving Energy Policy technical assistance.

Schedule: Short Term: 2019-2020

Example of Recommended Solution: IOU-Funded “Best Practices” Program (PY 2006-2008)
(See [Appendix D.1](#) for details.)

Recommendation 3.3.B: Build upon custom and/or existing CEC and Energy Code Ace checklists to improve efficiency and accuracy during plan review and field inspection.

Overview: In 2011, the Statewide IOU C&S team worked with Architectural Energy Corporation (AEC) to identify and share best practices and gaps in local city code compliance and enforcement. As part of this process, AEC learned that plan examiners used a simplified “cheat sheet” to supplement the CEC checklists to improve efficiency and accuracy during plan

reviews. Energy Code Ace has since continued to develop and maintain checklists to help plan examiners and building inspectors with residential and non-residential project review.

Key Market Actors: Plan Checkers, CEC, Energy Code Ace

The How: In collaboration with the CEC and or Energy Code Ace, develop, implement and iterate a suite of checklists focused on critical items that plans examiners and buildings inspectors must verify on the permit applications. Promote via 3C-REN Forums, ICC Chapter engagement, and Energy Code Coach visits to partnering building departments. Solicit feedback from users to prioritize requested changes to checklists and refine alignment for measures deemed most critical and of highest value.

Alignment with 3C-REN Goals:

- Compliance Improvements: Number of jurisdictions receiving Energy Policy technical assistance.
- Compliance Improvements: Percent of jurisdictions receiving Energy Policy technical assistance.

Schedule: Short Term: 2019-2020

Example of Recommended Solution: IOU-Funded “Best Practices” Program (PY 2006-2008) (See [Appendix D.1](#) for details.)

3.4 CALGreen

Recommendation 3.4.A: Identify best practices for CALGreen compliance. Design a forum to better encourage adoption of best practices in the workforce. Integrate top recommendations into 3C-REN trainings and building department resources.

Overview: Designers and other market actors must comply with CALGreen (Title 24 Part 11) and regularly work with clients that strive to exceed base Part 11 requirements and achieve Tier 1 or Tier 2 compliance. Yet Plans Examiners are likely to be uninformed about the importance and challenges of CALGreen implementation faced by Designers and Contractors. Plans Examiners also generally ranked other compliance responsibilities more important than the enforcement of the CALGreen Standards.

Key Market Actors: Plans examiners, building inspectors, building professionals

The How: Work with market actors to identify best practices for CALGreen compliance. Include information and findings relevant to base Title 24 Part 11 requirements versus requirements of voluntary Tiers 1 and 2. Include outreach to market actors working in jurisdictions with reach codes mandating a voluntary Tier (even if that jurisdiction is outside of 3C-REN territory) to help facilitate knowledge transfer of what it takes to effectively implement a reach code based on CALGreen.

Design a forum focused on CALGreen enforcement best practices that include presentations from designers, contractors, and building department staff. Pre-vet forum agenda and/or curriculum with ICC to secure authorization to award ICC continuing education credits and help drive attendance of local building department staff, who otherwise might not be approved to attend the forum. Request presenters prepare forum presentation materials with the objective that materials could be repurposed as learning tools that could be integrated into 3C-REN trainings and resources.

Alignment with 3C-REN Goals:

- Compliance Improvements: Number of jurisdictions receiving Energy Policy technical assistance.
- Compliance Improvements: Percent of jurisdictions receiving Energy Policy technical assistance.
- Penetration of forums: Number of participants

Schedule: Short Term: 2019-2020

Example of Recommended Solution: Codes and Standards Compliance Improvement Program 2013-14 (See [Appendix D.2](#) for details.)

Recommendation 3.4.B: Provide plans examiners, building inspectors and the building community with focused information on specific CALGreen topics via monthly outreach.

Overview: Plans Examiners are likely to be uninformed about the importance and challenges of CALGreen implementation faced by Designers and Contractors, including base requirements of CALGreen that must be met for all projects versus the requirements of voluntary Tiers 1 and 2 (provided the local jurisdiction has not adopted a reach code mandating compliance with Tier 1 or 2). Plans Examiners also generally ranked other compliance responsibilities more important than the enforcement of the CALGreen Standards.

Key Market Actors: Plans examiners, building inspectors, building professionals

The How: The Energy Code Coach service works with participating jurisdictions to select a specific topic each month for plans examiners and building inspectors to focus on during reviews and inspections; thereby, helping improve code enforcement. Discussion would focus on understanding the base requirements of Title 24 Part 11 and the potential additional requirements a project must address to achieve Tier 1 or Tier 2 compliance. Jurisdictions adopting a reach code mandating Tier 1 or Tier 2 compliance could be profiled via guest presentation (if this information is delivered as a webinar) or mini-case study (if information is delivered in written form). More research is needed to identify topics of interest. Title 24 Part 11 topics that receive significant interest through this information exchange could be integrated into existing and new 3C-REN trainings as well as other building department resources developed by 3C-REN.

Alignment with 3C-REN Goals:

- Compliance Improvements: Increase in code compliance knowledge pre/post training (reinforcement).
- Compliance Improvements: Number of jurisdictions receiving Energy Policy technical assistance.
- Compliance Improvements: Percent of jurisdictions receiving Energy Policy technical assistance.

Schedule: Short Term: 2019-2020

Example of Recommended Solution: Codes and Standards Compliance Improvement Program 2013-14 (See [Appendix D.2](#) for details.)

3.5 Compliance Documentation

Recommendation 3.5.A: Provide contractors and designers tools/resources and trainings to prepare and submit accurate compliance documentation.

Overview: Compliance documentation submitted by contractors and designers is sometimes incorrect. Contractors and designers working with projects that require significant technical expertise to submit accurate compliance documentation only do so at a cost for the building owner. 3C-REN can help Contractors and Designers prepare and submit accurate energy documentation by offering easy-to-use compliance tools/resources and trainings and connecting these market actors with readily available technical expertise or incentives provided by 3C-REN and other program implementers. Assisting with preparation of compliance documentation can also indirectly increase the percentage in closed permits for building projects triggering energy code compliance within participating jurisdictions by streamlining reviews and reducing the number of correction notices issued and thereby the risk that the permit applicant never comes back with the correct documentation.

Key Market Actors: Contractors, Designers, local building departments, training providers including utilities and trade associations

The How: Work with building departments to identify the most common errors in compliance documentation, focusing on measures deemed most critical and of highest value. Work with market actors to understand how to craft best practice guides, specialized trainings, and or technical support that would be most helpful to address and minimize these common errors. Offer resources and trainings to building professionals through 3C-REN events, including workshops or “getting to know you” meetings hosted at building department permit centers, and local industry associations and groups. Encourage Contractors and Designers to leverage

the expertise of the 3C-REN Energy Code Coach or Certified Energy Analysts (CEA) by offering building owners or building professionals financial incentives.

Alignment with 3C-REN Goals:

- Compliance Improvements: The percentage increase in closed permits for building projects triggering energy code compliance within participating jurisdictions (indirectly).
- Expanding WE&T Reach via Collaborations: Number of collaborations by Business Plan sector to jointly develop or share training materials or resources.
- Penetration of trainings: Number of participants by sector.
- Penetration of trainings: Percent of participation relative to eligible target population for curriculum.
- Diversity of participants: Percent of total WE&T training program participants that meet the definition of disadvantaged worker.

Schedule: Short Term: 2019-2020

Example of Recommended Solution: Codes and Standards Compliance Improvement Program 2013-14 (See [Appendix D.2](#) for details.)

BayREN Codes & Standards Permit Resource Opportunity Program 2013-14 (See [Appendix D.3](#) for details.)

Recommendation 3.5.B: Coordinate pre-construction meetings for large building projects to educate the contractor community about Title 24.

Overview: In 2011, the Statewide C&S team worked with Architectural Energy Corporation (AEC) to identify and share best practices and gaps in local city code compliance and enforcement. Pre-construction meetings for large scale building projects was a tool used by one jurisdiction as Title 24 code compliance best practice.

Key Market Actors: Building inspectors, building professionals

The How: Work with participating building departments to identify building and project types appropriate for pre-construction meetings and determine whether meetings will be required or optional for the permit applicant. Building department identifies existing staff that would attend pre-construction meeting along with appropriately qualified Energy Code Coach (based on building/project type). Energy Code Coach coordinates and/or participates in pre-construction meetings to review energy compliance forms and other permit required documentation including the documentation that will be required at project close-out. Contractors would benefit from field mentoring on Title 24 compliance.

Alignment with 3C-REN Goals:

- Compliance Improvements: The percentage increase in closed permits for building projects triggering energy code compliance within participating jurisdictions.

Schedule: Short Term: 2019-2020

Example of Recommended Solution: IOU-Funded “Best Practices” Program (PY 2006-2008)
(See [Appendix D.1](#) for details.)

3.6 Permit Tracking

Recommendation 3.6.A: In alignment with its long-term goals, 3C-REN should explore whether a mechanism to track permitted Energy Code measures, and other related data points, would provide additional information and insight into common alteration projects in a way that could eventually improve permitting and code compliance.

Overview: The majority of existing or planned electronic permitting systems are not equipped with a mechanism to track Energy Code measures. This can make tracking and reporting Energy Code compliance more challenging.

While unified permit tracking data would be valuable for measuring success, developing and increasing participation in an effective tracking tool that works for a wide variety of stakeholders is accepted to be challenging. As a result, this recommendation may be better for a mid- or long-term implementation schedule. In the interim, 3C-REN could also conduct interviews to investigate the barriers associated with this mechanism, including assessment of issues involving technical deployment, cost, or timeline. Additional research into the factors driving non-permitted work and benefits that electronic permitting could deliver to address these factors would also inform this effort.

Interestingly, survey responses indicate higher rates of non-permitted work for commercial alterations than residential. This seems to run counter to general trends of non-permitted work being more common in the residential market. Consistent tracking tools would support measuring this.

Alignment with 3C-REN Goals:

- Compliance Improvements: The percentage increase in closed permits for building projects triggering energy code compliance within participating jurisdictions (indirectly).
- Compliance Improvements: Number of jurisdictions receiving Energy Policy technical assistance.
- Compliance Improvements: Percent of jurisdictions receiving Energy Policy technical assistance.

Schedule: Short to Mid Term: 2019-2021

Example of Recommended Solution: CEC and Statewide IOU C&S team are working on separate efforts to track data for any permitted energy measures with an intent to develop analytics and models for internal staff and contracted research teams/consultants; and, provide

public access to nonconfidential project data through dashboards, standard file format outputs/reports, and potentially open source software.

Recommendation 3.6.B: Use HERS registries to track compliance of Title 24 energy efficiency measures. Identify gaps in code implementation or enforcement by analyzing data collected from measures triggering HERS assessment.

Overview: As part of the County of Marin’s reach code tracking project, sustainability staff are purchasing registry data to better analyze reach code compliance in Marin and other jurisdictions. This pathway was selected as an alternative to work to secure this information directly from individual building departments, each with their own permitting process.

Key Market Actors: Sustainability staff, HERS registry implementers.

The How: Identify communities/jurisdictions and energy measures of interest. Select datapoints of interest that HERS registries can provide (any field in the CF1R, CF2R, and CF3R forms) specific to installed measures, installing contractor, HERS rater or other 3rd party verifier if required, and permit applicant. Request data from CalCERTS or California’s Certified Energy Code (Title 24) Registry (CHEERS) and analyze it to identify gaps.

Alignment with 3C-REN Goals:

- Compliance Improvements: The percentage increase in closed permits for building projects triggering energy code compliance within participating jurisdictions (indirectly).
- Compliance Improvements: Number of jurisdictions receiving Energy Policy technical assistance.
- Compliance Improvements: Percent of jurisdictions receiving Energy Policy technical assistance.

Schedule: Short Term: 2019-2020

Example of Recommended Solution: CEC and Statewide IOU C&S team are working on separate efforts to track data for any permitted energy measures with an intent to develop analytics and models for internal staff and contracted research teams/consultants; and, provide public access to nonconfidential project data through dashboards, standard file format outputs/reports, and potentially open source software.

3.7 Reach Codes

Recommendation 3.7.A: 3C-REN could facilitate progress towards adoption of local reach codes through identification and promotion of cost-effective measures that exceed minimum code requirements, benchmarking or time-of-sale ordinances.

Overview: According to the local energy codes website managed by the IOUs, there have not been any reach codes successfully adopted in 3C-REN territory for the 2016 and 2013 code cycles. 3C-REN could work with respective jurisdictions interested in the adoption of reach codes or energy related ordinances, leveraging partnership with the Statewide C&S IOU and Reach Code advocacy groups to mitigate resource needs and help socialize/normalize reach code opportunities within 3-CREN territory based on what’s happening elsewhere in the state.

Key Market Actors: Local building departments, statewide IOUs, advocacy groups

The How: Facilitate networking and coordination with local communities to identify needs and interests of the community for energy efficiency topics and project opportunities that exceed base Title 24 requirements and other energy related requirements and statutes (i.e., benchmarking). Elevate those needs and opportunities to the Statewide Reach Code team to understand if and how those needs and opportunities are addressed in existing or in process reach code studies or whether they can be prioritized for a future study. Gather and refine existing tools to help promote adoption and, eventually implementation, of reach codes at the local level. Deploy and iterate those tools based on evolving needs. Provide additional support to targeted smaller jurisdictions.

Alignment with 3C-REN Goals:

- Reach Codes: The number of local government Reach Codes implemented.

Schedule: Short Term: 2019-2020

Example of Recommended Solution: BayREN organizes bi-weekly Reach Code Policy Working Group calls with local government staff to identify regional reach code interests and share best practices.

Recommendation 3.7.B: Recognizing there is willingness to take advantage of services for reach code adoption and implementation, 3C-REN in collaboration with Statewide IOU and advocacy groups (such as NRDC) should offer an introductory forum on reach codes that brings together sustainability staff with Plans Examiners and Building Inspectors.

Overview: Survey responses indicate that many Plans Examiners and Building Inspectors believe their jurisdictions have already adopted reach codes, which indicates many may be unfamiliar with the terminology or duration of reach codes. Additional education may clarify their understanding and support in future adoption. However, many of 3C-REN’s stakeholders are facing challenges adhering to current code, much less exceeding it.

Key Market Actors: Statewide IOU and advocacy groups, local building departments, training providers including utilities and trade associations

The How: Like Recommendation 3.7.A above, start by facilitating networking and coordination with local communities to identify needs and interests of the community for energy efficiency

topics and project opportunities that exceed base Title 24 requirements and other energy related requirements and statutes (i.e., benchmarking). Summarize the scale and range of local interest that rise above that required baseline. Work with CEC and Statewide IOU C&S team to understand the potential benefits that could be delivered locally by exceeding code as summarized.

Given the current priorities of 3C-REN, this recommendation may be best for the mid- or long-term timeline. If pursued in the short-term, consider heavily leveraging Statewide IOU and advocacy groups to mitigate resource needs, or pairing a high-level reach code overview with other trainings.

Alignment with 3C-REN Goals:

- Reach Codes: The number of local government Reach Codes implemented.
- Compliance Improvements: Increase in code compliance knowledge pre/post training (reinforcement).
- Compliance Improvements: Number of jurisdictions receiving Energy Policy technical assistance.
- Compliance Improvements: Percent of jurisdictions receiving Energy Policy technical assistance.

Schedule: Short Term: 2019-2020

Example of Recommended Solution: Codes and Standards Compliance Improvement Program 2013-14 (See [Appendix D.2](#) for details.)

BayREN Codes & Standards Permit Resource Opportunity Program 2013-14 (See [Appendix D.3](#) for details.)

3.8 Training

Recommendation 3.8.A: Facilitate building department promotion of code compliance best practice and adoption of enforcement best practice by leveraging existing C&S services, and deploying 3C-REN developed tools and services. Market 3C-REN services to ensure greater volume of participation.

Overview: While Energy Code Ace, CEC, CalCERTS, and private energy consulting firms already provide a variety of C&S tools and resources, survey comments indicate there is still a strong interest and demand for services, specifically an Energy Code expert and trainings, that address regional and local needs (as detailed in other responses). 3C-REN has an opportunity to offer services of added value to key market actors.

Key Market Actors: Building Departments, Contractors, Designers, and Energy Consultants

The How: Create a master list of all existing C&S services available to market actors in 3C-REN territory provided by, but not limited to, IOU, CEC, California Building Officials Training Institute (CALBO), American Institute of Architects (AIA) and ICC. Organize the master list by target audience, topic, type of resource (e.g. training, online tool, etc.). Cross reference survey results and comments to identify gaps and value-add opportunities. Design new services or help facilitate existing services that align with value-add opportunities. Market services to target audiences through building department permit centers, industry gatherings, online, or other aligned channels. Reference Statewide program best practices, particularly for encouraging a Title 24 “champion” mentality within jurisdictions for process improvements.

Alignment with 3C-REN Goals:

- Expanding WE&T Reach via Collaborations: Number of collaborations by Business Plan sector to jointly develop or share training materials or resources.
- Penetration of trainings: Number of participants by sector.
- Penetration of trainings: Percent of participation relative to eligible target population for curriculum.
- Diversity of participants: Percent of total WE&T training program participants that meet the definition of disadvantaged worker.

Schedule: Short Term: 2019-2020

Example of Recommended Solution: Codes and Standards Compliance Improvement Program 2013-14 (See [Appendix D.2](#) for details.)

Recommendation 3.8.B: 3C-REN in partnership with trade organizations should create short- and half-day Title 24 classroom trainings that include practical, in-the-field examples.

Overview: Energy Code Ace provides the most robust classroom trainings available within the state, but these trainings are typically full day trainings and are often geared to a wide cross section of building professionals (though Energy Code Ace does offer specific trainings focused on Plans Examiners and Building Inspectors). Building department staff have also anecdotally reported that they prefer shorter trainings that does not call them away from their job duties for a full day. Also, while Energy Code Ace classes take a comprehensive approach to training content, many building department staff prefer more tailored content that explicitly focuses on the most common building type and projects they encounter.

Key Market Actors: Building Departments, Contractors, Designers, and Energy Consultants

The How: Trainings could focus on areas of non-compliance. Topics could include “plans and specifications” and a key outcome for all trainings should be to provide information about best practices that attendees can use to deliver a higher level of service to customers. 3C-REN should also explore online and live-webinar trainings. The CEC and or Energy Code Ace staff could be invited to participate or co-present when appropriate.

Alignment with 3C-REN Goals:

- Expanding WE&T Reach via Collaborations: Number of collaborations by Business Plan sector to jointly develop or share training materials or resources.
- Penetration of trainings: Number of participants by sector.
- Penetration of trainings: Percent of participation relative to eligible target population for curriculum.
- Diversity of participants: Percent of total WE&T training program participants that meet the definition of disadvantaged worker.

Schedule: Short Term 2019-2020

Example of Recommended Solution: BayREN Codes & Standards Permit Resource Opportunity Program (See [Appendix D.3](#) for details.)

3.9 Workforce

Recommendation 3.9.A: Explore how to help building professionals overcome barriers preventing them from supporting basic and innovative construction practices, particularly with new mandatory requirements in Title 24 Part 6 as well as with more advanced requirements with Passive House and CALGreen. Opportunities for joint training sessions for both building professionals and building department staff may help these market actors reach a more shared understanding and support skilled employee retention.

Overview: Apart from Energy Consultants, most building professionals only possess the minimum required types of certifications (Energy Consultants typically hold GreenPoint Rater, Home Energy Rating System (HERS) Rater, Building Performance Institute (BPI), and Leadership in Energy and Environmental Design (LEED) certifications in addition to California Association of Building Energy Consultants (CABEC) Residential Certified Energy Plans Examiner, Residential and Nonresidential CABEC Certified Energy Analyst certifications). An inadequately skilled workforce can result in high employee turnover and low productivity, indirectly negatively impacting energy code compliance rates, work quality, and customer costs. While advanced energy best practices including Passive House and CALGreen voluntary Tiers may require advanced skill sets to match, even “common” best practices that become part of new mandatory Title 24 requirements (such as Quality Insulation Installation/QII) pose challenges for a sufficiently trained workforce. 3C-REN has an opportunity to indirectly help buildings professionals overcome whatever barriers prevent them from attaining more certifications, providing career pathways to workers and improving compliance.

If the barrier is monetary, 3C-REN, CABEC and local HERS raters can offer financial incentives. Based on other survey responses, opportunities for joint training sessions for both building professionals and building department staff may help these market actors reach a more shared

understanding of code requirements, installation best practices, field issues, and general alignment on compliance and enforcement priorities within common project types.

Key Market Actors: Building departments, contractors, designers, energy consultants, and HERS Raters

The How: Additional research is needed to better understand the barriers preventing building professionals from attaining more certifications. Data from and interviews with certification providers, such as CABEC, ICC, CalCERTS and USGBC, and workforce development agencies, such as local community colleges, trade schools, and apprentice programs, could help narrow the list of barriers. Once the most common barriers have been identified, 3C-REN could develop public private partnerships with these or other providers and agencies and design a service that increases the number of adequately skilled workers, and, indirectly, improve compliance. Partnerships could extend to direct installer vendors committed to provide career pathways to disadvantage workers.

Alignment with 3C-REN Goals:

- Compliance Improvements: The percentage increase in closed permits for building projects triggering energy code compliance within participating jurisdictions (indirectly).
- Expanding WE&T Reach via Collaborations: Number of collaborations by Business Plan sector to jointly develop or share training materials or resources.
- Diversity of participants: Percent of applicable incentive contract spend by vendors with a demonstrated commitment to provide career pathways to disadvantaged workers.

Schedule: Short to Mid Term: 2019-2021

Example of Recommended Solution: Codes and Standards Compliance Improvement Program 2013-14 (See [Appendix D.2](#) for details.)

Recommendation 3.9.B: Forums should be designed to better encourage adoption of best practices in the workforce and facilitate networking between building departments, construction and design firms, and qualified and or aspiring building professionals.

Overview: In 2016, DNV-GL conducted a study of the Bay Area Regional Energy Network (BayREN) and the California Investor-Owned Utilities (IOUs) compliance improvement (CI) activities in program year (PY) 2013-14. The study evaluated if the CI activities addressed known barriers to energy code compliance, if CI program participants found value in the program offerings, and which of the CI program components are effective in changing behavior and effecting compliance. According to survey results, BayREN forum participants found the most value in networking. This provides a potential channel for 3C-REN to integrate workforce development issues into a code compliance opportunity.

Key Market Actors: Training providers, building professionals, and trade associations

The How: 3C-REN should consider designing select forums to address the confluence of workforce education and code compliance. This could involve encouraging the adoption of advanced best practices in basic training and mentoring offered by workforce development agencies and promoting pathways from entry level energy efficiency positions to more advanced positions within the business models of key market actors. Forums could also be set up to promote networking between construction and design firms and aspiring building professionals, including even hosting the forum at workforce development agencies or training sites. Forums should be designed with clear objectives that focus on the stakeholder needs that can be tracked to determine outcomes. Similarly, networking opportunities could include time to share diverse experiences, discussions of potential challenges and solutions about REN programs, and other technical discussions.

Alignment with 3C-REN Goals:

- Penetration of forums: Number of participants
- Expanding WE&T Reach via Collaborations: Number of collaborations by Business Plan sector to jointly develop or share training materials or resources.

Schedule: Short Term: 2019-2020

Example of Recommended Solution: Codes and Standards Compliance Improvement Program 2013-14 (See [Appendix D.2](#) for details.)