RTR Appendix

Southern California Edison, Pacific Gas and Electric, Southern California Gas, and San Diego Gas and Electric ("Joint Utilities" or "Joint IOUs") developed Responses to Recommendations (RTR) contained in the evaluation studies of the 2010-2012 Energy Efficiency Program Cycle. This Appendix contains the Responses to Recommendations in the report:

***Residential ZNE Market Characterization***
(2015, TRC Energy Services, Calmac ID# PGE0351.01)

The RTR reports demonstrate the Joint Utilities' plans and activities to incorporate EM&V evaluation recommendations into programs to improve performance and operations, where applicable. The Joint IOUs' approach is consistent with the 2013-2014 Energy Division-Investor Owned Utility Energy Efficiency Evaluation, Measurement and Verification (EM&V) Plan (version 3) [1] and CPUC Decision (D.) 07-09-043[2].

Individual RTR reports consist of a spreadsheet for each evaluation study. Recommendations were copied verbatim from each evaluation's "Recommendations" section.[3] In cases where reports do not contain a section for recommendations, the Joint IOUs attempted to identify recommendations contained within the evaluation. Responses to the recommendations were made on a statewide basis when possible, and when that was not appropriate (e.g., due to utility-specific recommendations), the Joint IOUs responded individually and clearly indicated the authorship of the response.

The Joint IOUs are proud of this opportunity to publicly demonstrate how programs are taking advantage of evaluation recommendations, while providing transparency to stakeholders on the "positive feedback loop" between program design, implementation, and evaluation. This feedback loop can also provide guidance to the evaluation community on the types and structure of recommendations that are most relevant and helpful to program managers. The Joint IOUs believe this feedback will help improve both programs and future evaluation reports.

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[1] Page 336,"Within 60 days of public release of a final report, the program administrators will respond in writing to the final report findings and recommendations indicating what action, if any, will be taken as a result of study findings. The IOU responses will be posted on the public document website." The Plan is available at http://www.energydataweb.com/cpucFiles/pdaHomeDocs/2/2013-2014_Energy_Efficiency_EMV_Plan.zip (visited on 10/1/14).

[2] Attachment 7, p.4, "Within 60 days of public release, program administrators will respond in writing to the final report findings and recommendations indicating what action, if any, will be taken as a result of study findings as they relate to potential changes to the programs. Energy Division can choose to extend the 60 day limit if the administrator presents a compelling case that more time is needed and the delay will not cause any problems in the implementation schedule, and may shorten the time on a case-by-case basis if necessary to avoid delays in the schedule."

[3] Recommendations may have also made to the CPUC, the CEC, and evaluators. Responses to these recommendations will be made by Energy Division at a later time and posted separately.

**EM&V Impact, Process, Market Assessment Study Recommendations**
**Study Title:** **Residential ZNE Market Characterization, February 27, 2015**
**Program:** **ZNE**
**Author:** **TRC**
**Available at:** **CALMAC PGE0351.01**
**This RTR [requires/does not require] an Advice Letter [and/or] PIP addendum, [if yes, indicate AL/PIP number here and reference the item numbers/recommendations requiring the change].**

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| 1 | 95 | Collaboration will be critical: In general, the TRC team notes that many of the barriers to ZNE-type homes will require actions by various stakeholders and market actors—not just the California regulatory agencies and the PAs—and that several of the issues and barriers are not specific to California. | The TRC team encourages the regulatory agencies and the PAs to continue to expand active engagement with industry groups and ZNE leaders, both at the state and national level. These collaborations should leverage existing initiatives that are promoting ZNE-type homes to achieve the rapid increase in knowledge and other market transformation steps that will be necessary for meeting California's aggressive ZNE goals | IOUs and CPUC | Accepted | IOUs are working with various organization/conferences including, but not limited to, the Net Zero Energy Coalition NZEC) and the New Buildings Institute (NBI) to advance ZNE principles and techniques we note that builders and their suppliers (especially manufacturers) are national and international in scope and are not concerned solely with California as they pursue business. The key trades groups that PA's currently work directly with that can be leveraged to assist in expanding the working knowledge of builders in support of ZNE type homes. |
| 2 | 95-96 | ZNE residential new construction by 2020 will require a complete market transformation: While this study found that the penetration of ZNE-type homes has increased to approximately 1% for 2014 (up from 0.2-0.4% in previous years), this still represents the innovator stage of market adoption. In addition, ZNE homes comprise only ~0.01% of the market; the majority of ZNE-type homes found in this study are near ZNE.<br>To move ZNE along the market adoption curve from the innovator stage in 2014 to being widely available and the industry norm in 2020, will require a market transformation in only six years. | If California truly intends to achieve all ZNE new construction by 2020, the California agencies that set the ZNE targets and the PAs that support these strategies must markedly increase efforts to educate, train, and financially support the market towards adoption of ZNE-type homes; expand efforts to market and message ZNE-type homes to increase consumer demand; prioritize ZNE- related research; and hasten the pace of ZNE-related policies. | IOUs and CPUC | Accepted/Other | IOUs are working to support improved efforts for training, education, and financing and a number of initiatives around these areas outlined in the Res ZNE Action/Work Plan. With limited funding, prioritizing areas of marketing and communication will be key in promoting the adoption and understanding of ZNE homes. It is anticipated that as code advances toward ZNE, incentives will continue to be a driver for early adopters. |
| 3 | 96 | The state agencies, PAs, and other collaborators are working to design and implement many of the solutions needed to reach the 2020 goals. In addition, the market transformation to ZNE that California has called for represents unchartered territory, which has not been accomplished elsewhere | Expand proven efforts and test new approaches | IOUs and CPUC | Accepted | IOUs are working to support improved efforts for training, education, and financing and a number of initiatives around these areas outlined in the Res ZNE Action/Work Plan. CAHP, for example, continues to be innovative and places significant time and effort into ensuring that it's implementation is geared toward pushing the residential market towards ZNE as standard practice. Tangible and practical deliverables, goals, and accountabilities need to be defined to help meet this goal. |
| 4 | 97, 101-102 | As described in Section 5.1, this study identified 16 ZNE homes according to the CAHP and RFI data, representing 0.01% of total market share. However, this study found almost one thousand near ZNE homes (i.e., highly efficient with distributed generation), and it found that near ZNE homes represented approximately 1% of the market in 2014. The number of near ZNE homes also appears to be higher than the number of ZNE-ready (i.e., highly efficient without distributed generation) homes. The prevalence of near ZNE home and the scarcity of ZNE homes indicates that the market may be more ready to embrace near ZNE construction than ZNE construction in the short term. Incremental cost is the biggest barrier to all ZNE-type home construction. | Expand programs targeting ZNE, and for ZNE-ready and near ZNE homes, particularly within 5-10% of the incremental cost compared to a code-built home | IOUs and CPUC | Accepted/Other | IOUs are actively working to find ways to reduce the incremental cost of high-performance building measures and plan to increase these efforts, including results dissemination. The IOUs have developed a robust new CAHP program, which will facilitate program expansion of ZNE ready homes. CAHP design is meant to offset a generous percentage of the incremental costs of building to ZNE and targeting ZNE ready design is vital as that is the aspect of a project CAHP incentives can influence. Restrictions associated with program metrics (TRC, IMC) impact the exploration of incentive bonus within the CAHP framework. |
| 5 | 97,102 | ZNE-type and energy efficient homeowners indicated that their willingness-to-pay for their next ZNE-type home increased with their perceived value of their current home. Consequently, once an owner purchases a ZNE-type or an energy efficient home, he/she may be more likely to pay for a ZNE home. | Continue programs for Energy Efficient homes as a stepping-stone for ZNE, but target builders that have been non-participants to date | IOUs and CPUC | Accepted | IOUs recognize that it is important to target new customers for the residential new construction programs. Our current programs currently work with the largest builders in our state that produce the largest stock of residential building inventory. Additionally, IOUs are actively soliciting participation from new builders in the Production Builder Residential ZNE Demonstration. It is important to note that some builders do not participate due to their nationalal scope and limitations on their profit models. |

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| 6 | 97,103 | Currently, under most of the PAs' programs (including the IOU programs), builders use two different programs to receive all possible incentives for energy efficiency and PV (CAHP and NSHP), which is cumbersome. Also, some program managers reported the need for improved collaboration between these programs, including better data sharing. The TRC team concurred with program managers after reviewing the CAHP and NSHP databases and finding various differences in how these programs track projects. In addition, the previous PV kicker for some IOU CAHP programs required that all homes in a development have PV to receive an incentive. | Transition to a single market transformation program for energy effciency and distributed generation | All IOUs | Other | From 2008 until 2014 the IOU's implemented both programs (CAHP & NSHP) side by side. Current utility programs are best suited for offering incentives regarding energy efficiency technologies/building advancements but cannot offer incentives for distributed generation due to administration bifurcation. Consistent policy direction provided by the CPUC, the IOUs would be willing to initiate a major effort to transition to a "single program" approach to ZNE for energy efficiency and distributed generation. |
| 7 | 97,104 | There are various organizations working towards the ZNE goal, but they track homes using different metrics and database formats. This hinders the ability for any one organization to quantify the number of ZNE-type homes and track progress towards ZNE goals. | Because different organizations track ZNE-type homes using different metrics, develop a central repository of ZNE-type homes or (at a minimum) consistent tracking metrics for tracking progress towards ZNE goals | All IOUs | Accepted | IOUs are supporting the NZEC which is actively constructing a national central database. IOUs will also collaborate with other national entities like National Labs and NBI that are conducting such efforts. |
| 8 | 97,104 | Builders reported that many subcontractors and builders of code-compliant homes do not have the knowledge needed to execute advanced building practices successfully. Building officials reported challenges in the code compliance process, both with homes built to code and those built above code. | Continue and expand education efforts for builders and their contractors and trades regarding code compliance and above code building practices | All IOUs | Accepted | IOUs continue these effort through Codes & Standards Program through various means including Workforce Education and Training. |
| 9 | 97,105 | ZNE-type homes present a quandary to the lending community.<br>Lenders need larger volumes of energy efficient or ZNE-type homes to make financing these products through EEMs or other mechanisms worth their while due to the increased paperwork and home rating requirement presented by EEMs. Lenders noted that most homebuyers are not aware of EEMs; if they are, they usually learn about them after they have identified a home for purchase, not during the decision-making stage. Lenders also noted that they have a shortage of appraisers with the necessary training to conduct valuations of ZNE-type homes. | Support real estate agents and lenders by holding symposiums for builders, appraisers, lenders, and realtors with interest and training in ZNE-type homes; bringing together ZNE-type homebuilders and Energy Efficient Mortgage (EEM) lenders; investigating a model through which a facilitator handles the additional paperwork of an EEM; providing a platform for connecting lenders with appraisers trained on ZNE-type homes; and providing training for realtors on how to recognize and promote ZNE-type home features. | All IOUs | Other | IOUs believe the indicated activity is appropriate for utilities (symposia, realtor training). Through our existing programs the Utilities have connections with these stakeholders and are well positioned to intervene to support ZNE homes. |
| 10 | 98,106-107 | Builders reported they have concerns that owners will misinterpret ZNE. This was supported by feedback from owners. Among owners that reported to be aware of the term ZNE, approximately one-third interpreted ZNE as either zero bill or a home that is off-the-grid. Two ZNE-type owners reported that "zero" is unachievable, and is a term that should not be used lightly.<br><br>Builders and building industry experts recommended the use of demonstration homes. This was supported by reports from owners in the ZNE-type forum, who reported that the demonstration was influential in their purchasing decision and who could recall specific aspects of the demonstration years after touring it. In addition, approximately one-third of the ZNE-type and Energy Efficient owners that were familiar with the term ZNE reported that their source of awareness was a showcase home. | Work with builders to develop clear and consistent messaging for the 2013 IEPR's ZNE definition that builders are comfortable promoting, and expand the reach of ZNE-type demonstration homes. | All IOUs | Accepted/Other | IOUs note, by way of significant experience, that the communication of the practical meaning of IEPR "code zero" is difficult and somewhat counter-intuitive. IOUs can help builders on new communications once messaging is developed with relevant stakeholder groups like CBIA and CEC. |

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| 11 | 98,107 | About half of production ZNE-type owners and Energy Efficient owners reported they had concerns at the time of home purchase about resale value. However, studies have shown that homes with energy efficiency labels or PV sell for a higher value on average compared to Code-built homes (e.g., Kok 2012, LBNL 2013b, LBNL 2011, and ConSol 2008). | Provide educational toolkits to help builders address homebuyers' concerns about the re-sale value of ZNE-type homes, by promoting study results showing higher resale values of Energy Efficient and solar homes. | All IOUs | Other | IOUs agree that this is a logical recommendation but recognizes that there are limited available studies demonstrating such an increase in value. Available sample sizes to demonstrate increased value are relatively small to draw conclusions. We are committed to supporting efforts to establish the value of Energy Efficient homes. |
| 12 | 98,107 | Per the state's loading order established in the state's Energy Action Plan (CEC and CPUC 2013) and the CEC's 2013 IEPR, achieving ZNE residential new construction goals requires equitable promotion of energy efficiency and distributed generation measures to maximize the benefits of ZNE. Currently, there are several policies to promote distributed generation, such as rebates, tax credits and net energy metering policies. All of these policies are undergoing potential changes. Navigant (2014a-c) indicated that confusion in the market over net metering may hinder market adoption of PV. In this study, builders and program managers reported that consumers questioned how they will be compensated for energy supplied to the grid. (This study did not ask owners directly about their net metering concerns.) In this study, some owners with PV reported they did not expect the annual "true up bill" they received from their utility, and that this was a source of dissatisfaction. | Once the State agencies update net-energy metering and other policies, work with these agencies, builders, and PV installers to educate homebuyers on how these policies affect them. | IOUs and CPUC | Accepted | Plans are pending based on the specifics of various market changes (such as NEM reform) cited in the recommendation. |
| 13 | 98,108 | ZNE is technically feasible, but the biggest barrier is incremental cost, and builders' concern that consumers may not pay this incremental cost. Based on interviews with high performance builders, building industry experts, and program managers, the incremental cost for a ZNE home is approximately 5-15% more than the cost to build a Code-built home. ZNE-type owners and Energy Efficient owners, reported they were willing to pay approximately 8-12% more, and 1-10% more, respectively, for their next home to be a ZNE-type home compared to a Code-built home. | Reframe the incremental cost paradigm by providing additional incentives and technical assistance to builders that meet the following challenge: using an identical budget for your non- ZNE home, how would you build a ZNE home that is as comparable as possible? | IOUs and CPUC | Accepted | IOUs plan to focus additional work on making the "constructability" of ZNE homes as cost-effective as possible, with subsequent communication of results. It is important to note that the incremental cost is only for the EE measurers. The addition of solar and how to fund is a large contributing factor into those costs. While it is possible to receive increased incentives through CAHP specifically for this, not only through the point scoring system, but also via the additional CAHP points that assist participants with getting closer to ZNE ready. The IOUs will continue on building techniques that reduce the incremental cost of achieving high performance including issues affecting code, the technologies themselves and the installation techniques. |
| 14 | 98,108 | Comfort appears to be an important purchasing criterion for owners, and builders include comfort benefits in their messaging of ZNE-type homes. Based on the small number of owners in this study, ZNE-type and Energy Efficient owners indicated they were generally satisfied with the comfort provided by their homes, while several Code-built owners expressed dissatisfaction with the comfort of their homes. | Support builders in highlighting comfort benefits of ZNE-type homes through customer testimonials. | All IOUs | Accepted | IOUs plan to conduct additional work in this area, emphasizing that high-performance ZNE homes can be built to have superior comfort and health-related characteristics compared to standard homes. We recognize the framed benefits are large motivators programs like Energy Upgrade' whole house retrofit programs but an adequate ZNE customer population must be available. |
| 15 | 99,109 | About one-quarter (12 of 42) of ZNE-type owners and one-third (34 of 109) of Energy Efficient owners reported they had initial concerns about managing high tech features, including the monitoring or operation of PV systems, HVAC systems, or other measures. Owners of homes with PV were significantly more likely to report a concern managing high tech features at the initial time of purchase. This study did not rigorously explore whether these concerns were actual or perceived, although two ZNE-type owners mentioned that they do have difficulties managing high tech features. | Address homebuyers concerns about managing high tech features by providing template homeowner orientations to builders. | All IOUs | Other | The IOUs believe that "simpler is better" and that, while supporting ideas around management of high-tech features, emphasis on simplicity in design and construction of home features is likewise important and useful. The IOUs continue to support the building of demonstration sites/homes that can be used to familiarize or train stakeholders on the use of high tech features. |

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| 16 | 99,109 | Several owners in this study described that they liked the in-home display feature of their PV system. In addition, many market actors pointed to the need for owners to be aware of the impact of their behaviors on their home's energy performance. | Based on customers' satisfaction with PV displays, encourage builders to install home energy monitoring systems. | All IOUs | Accepted/Other | The IOUs note whole house performance monitoring, communicated by way of a dashboard, should be promoted and all opportunities to integrate and promote energy monitoring will be explored. Items for consideration is the medium and frequency (i.e. tablet, phone and timeframe). There is need for further investigation of the value for consumers. |
| 17 | 99,109 | Owners indicated a preference for natural gas appliances. However, some builders consider ZNE to refer to electricity only (e.g., zero out electricity use only, or believe that a ZNE home must be all- electric), and one voluntary labeling program only considers electricity in its definition of ZNE. In addition, as the penetration of distribution generation and renewable energy increase, the cost effectiveness of, and greenhouse gas emissions from, electric appliances will change | Investigate consumer preferences, greenhouse gas emissions, and cost effectiveness impacts (to the owners and the utilities) of equipment with different fuel sources, under an evolving grid. | All IOUs | Acccepted/Other | IOUs agree that customer preference and the inclusion of all fuels should be prominent in fuel choice promotions and ZNE communications. The IOUs also believe that development of state policy around GHG reduction is also critically important. The IOUs will willingly participate in further work should examine causality between customer preference, cost effectiveness and GHG reduction. |
| 18 | 99,110 | CAHP program managers noted the difficulty for programs to track progress towards ZNE using a Title 24-based metric, because it does not include all energy loads, and it does not indicate a ZNE home. The TRC team concurs that this is a challenge after conducting market size analysis for this study. | To address the difficulty of tracking progress towards ZNE under a Title-24 based metric, identify an EUI-based metric for tracking projects in energy efficiency and distributed generation programs **(CEC)** | Other | Accepted | IOUs are eager to develop the simplest and best communications tools feasible based on accepted and sanctioned metrics. An EUI-based metric maybe a better way to track all of the buildings energy usage whether it's residential or commercial. |
| 19 | 99,110 | While the state agencies continue to make progress on clarifying how TDV addresses energy efficiency, there is no clear policy on how distributed generation, and PV in particular, will be addressed.<br>With potential changes to net energy metering, it is important that the TDV metric keep pace with future changes. One risk of assuming status quo for PV valuation in the next round of TDV updates is that any changes in net energy metering or tax credits that are not captured in TDV will result in a disconnect between valuation in codes and valuation in the real world. This is especially true if TDV assigns higher value to PV exports than regulatory policies assign in the future. In an extreme scenario, TDV could require oversized PV systems that provide value to the owner on paper; but in reality, the owner does not capture that value in their levelized cost of energy paid for the system. On the other end of the spectrum, if TDV assigns a lesser value to PV exports than those assumed in net energy metering and other proceedings, codes could appear to be punitive to distributed generation. | Finalize policies for how TDV will account for PV generation in the CEC's TDV-Lifecycle cost update process. **(CEC)** | Other | Accepted | IOUs will work with the CEC, CPUC and stakeholders to clarify these issues so customers understand and benefit from any revised policy making. |
| 20 | 99,111 | One city planner noted that not every home can feasibly achieve ZNE on its own, due to lack of roof space or orientation. In addition, other researchers (e.g., Goldstein 2012) have pointed to the need to consider additional energy uses related to a home (e.g., embedded energy of water, proximity to public transportation or walkable neighborhoods) in the definition of ZNE | Because not all homes can feasibly achieve ZNE on their own (e.g., due to lack of roof space for PV), develop equivalencies for the distributed generation aspect of ZNE. **(CEC)** | Other | Other | The IOUs are pleased to assist the CEC in developing policy and transaction related elements to support acquisition of off-site renewables within the building permit process. |
| 21 | 99,111 | City planners reported that jurisdictions are aware of ZNE, but they generally do not see ZNE ordinances as politically viable or cost effective from builders' perspectives under current market conditions. In addition, most planners noted that their jurisdictions are "waiting and seeing" what happens at the state level for ZNE. Planners also noted that voluntary provisions can be politically easier to pass than mandatory requirements. | Work with planners to develop short-term voluntary provisions, with carrots for ZNE-type construction. **(CEC)** | Other | Accepted | IOUs will support creative efforts to improve the penetration of ZNE at the local jurisdiction level. Reach Codes that incorporate ZNE targets are currently being developed via the statewide Codes & Standards team. |
| 22 | 99,111 | Appraisers' most noted barrier is the lack of sales data for high performance homes. They further reported that another barrier is inconsistent reporting of high performance elements by realtors in the MLS databases. | To address appraisers' challenges from the lack of sales data for ZNE-type homes, work with the National Association of Realtors and the California Bureau of Real Estate (CalBRE) to encourage realtors to provide energy use disclosures. **(CEC)** | Other | Accepted | IOUs will support such efforts within policy guidance consderations around privacy and other potential policy challenges. |

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| 23 | 100,112 | Based on interviews with ZNE-type owners, homeowners may interpret ZNE based on actual energy performance, but builders, policy makers, and the PAs currently interpret ZNE based on projected energy performance.<br><br>In addition, owners indicated that their primary driver for purchasing an Energy Efficient home or a ZNE- type home was reduced utility bills. However, builders are wary of making energy bill promises, because the actual performance can vary widely due to occupancy and behavior.<br><br>About half of builders indicated that they do not use HERS in discussions with owners because they think it is too confusing. This was confirmed by owners, who generally could not recall what information the HERS rating provided. | Because owners may interpret ZNE based on actual rather than modeled energy performance,<br>collect performance data from occupied ZNE-type homes to: (1) understand how occupant behavior can affect energy use, (2) develop ranges of energy use based on actual ZNE-type homes, and (3) improve energy modeling. | IOUs and CPUC | Accepted | IOUs are actively collecting such data, albeit the number of buildings available to sample is small. While consumers and Policy makers may use similar terms but have differences in their associated expectations leading to a misunderstanding of what a ZNE home means and its value. The Statewide IOU led EM&V study objective for "An Evaluation Framework for Residential ZNE Buildings." is to develop evaluation methodologies for ZNE buildings; including differences between design of ZNE buildings (projected energy use) and performance of ZNE buildings (how occupied ZNE buildings use energy). |
| 24 | 100,112 | This study developed a catalog of energy performances in Section 3.4.2, which included Code-built, Energy Efficient, ZNE-ready, near ZNE, and ZNE homes. | In future ZNE-type home studies, use and improve the catalog of energy performances developed in this study. | All IOUs | Accepted | The study research plan mentioned above which is slotted for completion in early 2016, includes the use and improvement of the catalog of energy performances developed in this study as one of the main study objectives. Additionally, IOUs are working with NZEC and other organizations on their performance databases and nomenclature. |
| 25 | 100,113 | This study had several limitations, including that the TRC team targeted ZNE-type market actors (rather than the broader market) for feedback, focused on the single-family homes market, and collected data at one point in time. | Develop an evaluation research plan to support the State's ZNE goals including a full market baseline study that gathers feedback from the broader market, a market transformation study around 2018, and a market characterization of multifamily homes. | IOUs and CPUC | Accepted | The EM&V research roadmap lists two ZNE Market Characterization studies: "Commercial ZNE Market Characterization" and "K-12 and Community College ZNE Retrofit Readiness Market Characterization Study" to be completed in 2016 and lead by the Energy Division. IOUs recommend that a project be conceptualized, pr oposed and funded with CPUC and ED guidance. |
| 26 | 100,113 | The TRC team generally asked broad questions regarding distributed generation, but almost all market actors responded by discussing rooftop PV rather than community-scale distributed generation or other community-scale distributed energy resources (DERs). In addition, the ZNE-type home case studies reviewed by the TRC team did not use community-scale DERs. | The lack of market actor experience with renewable energy resources beyond rooftop PV demonstrates the need to understand barriers and opportunities for community-scale Distributed Energy Resources (DERs) options for ZNE-type homes. | IOUs and CPUC | Accepted | IOUs generally believe that PV is likely to be the dominant source of renewables at the individual building or community scale. ownership/funding/maintenance issues have been a challenge with community solar.<br><br>The EM&V research roadmap lists a 2015 study "ZNE Compliance Options for Distributed Energy Resources Phase 1," which will investigate barriers and opportunities for community scale DER installations in ZNE type home developments. This study will be led by either the IOUs or the ED. |
| 27 | 100,114 | A study by the U.S. DOE (2011) found that the heavy focus on air sealing without designed ventilation provisions could negatively affect health, safety, and durability. Many owners, including production Energy Efficient owners and custom ZNE-type owners, reported that they had initial concerns (at the time of home purchase) regarding sufficient ventilation. Many ZNE-type and Energy Efficient owners also reported having initial concerns about operating their homes high-tech features. This study did not ascertain whether these concerns are perceived or actual. | Track operational issues with ZNE-type homes so that builders can improve construction practices to address actual homebuyer concerns and develop messaging to address perceived concerns. | All IOUs | Accepted | The IOUs agree that this is an essential activity and agree to provide leadership on this effort, but requires broader collaboration with other stakeholders to determine the best approach to collect, analyze and provide feedback on operation issues for ZNE homes. The builders would know customer concerns and communicate to the IOUs on how we can assist. Early information suggests there is a high degree of satisfaction with high efficiency houses. |