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California Energy Commission

FINAL STAFF REPORT

2025 Update of the Field Verification and Diagnostic Testing Requirements

**California Code of Regulations Title 24,
Parts 1 and 6**

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ABSTRACT

The Warren-Alquist Act directs the California Energy Commission (CEC) to adopt and implement the Building Energy Efficiency Standards (Energy Code) as a primary means to reduce wasteful, uneconomical, and unnecessary uses of energy.

The CEC adopted provisions in the Energy Code to verify that installations (and others) are consistent with Energy Code requirements. Poor installation of air ducts and conditioning equipment in residential buildings have been a concern since the 1980s. In 1999, the CEC promulgated the Home Energy Rating System regulations in California Code of Regulations, Title 20, Sections 1670 through 1675. These regulations provided for and regulated raters to perform field verification and diagnostic testing services.

This report presents proposed changes to the field verification and diagnostic testing program to make the program more effective in ensuring compliance with the Energy Code. As California seeks to reduce greenhouse gas emissions and, among other efforts, decarbonize buildings by installing 6 million heat pumps in buildings by 2030, clear and effective program regulations are increasingly important.

The reliance of the field verification and diagnostic testing program on the Home Energy Rating System regulations located in Title 20 has made compliance difficult for stakeholders, who have requested simplification of the Energy Code. Other deficiencies addressed in this report include issues that staff identified through various efforts, investigation of complaints, submissions to Docket Number 12-HERS-01, and information collected from the order instituting an informational proceeding (Order Number 12-1114-6).

The scope of the changes proposed in this staff report focus on conduct, responsibility, and quality assurance for the field verification and diagnostic testing program, as well as increased oversight by the CEC to improve program performance and protect consumers. The CEC intends to update the Energy Code with these proposed changes to implement improvements to this program.

Keywords: Field verification and diagnostic testing, ratings, Home Energy Rating System, raters, providers

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EXECUTIVE SUMMARY

The Warren-Alquist Act, Public Resources Code, sections 25000 *et seq.*, establishes the California Energy Commission (CEC) as the state's primary energy policy and planning agency. Section 25007 of the act directs the CEC to "employ a range of measures to reduce wasteful, uneconomical, and unnecessary uses of energy, reducing the rate of growth of energy consumption, prudently conserve energy resources, and assure statewide environmental, public safety, and land use goals." As part of accomplishing this mandate, the CEC promulgates building energy efficiency standards for newly constructed buildings and additions and alterations to existing buildings. These building energy efficiency standards are also known as the "Energy Code."

The Energy Code is critical to fulfilling CEC's mission and achieving the state's greenhouse gas reduction goals. Robust and effective field verification and diagnostic testing (FV&DT) performed by independent third-party trained technicians is intended to support successful implementation of the Energy Code. FV&DT helps ensure that consumers get the energy (and monetary) savings they expect from their investment in efficiency projects and helps reduce the unnecessary consumption of energy. Further, building decarbonization is needed to achieve state climate goals. As part of California's climate action plan, Governor Gavin Newsom, in a July 22, 2022, letter to the chair of the California Air Resources Board, set a goal of installing 6 million heat pumps in buildings by 2030 as recommended by the CEC. Clear and effective FV&DT program regulations are important in making sure these and other energy installations perform as expected as part of California's climate response.

This report presents the FV&DT program issues staff initially identified through investigating complaints (including Docket Number 12-HERS-01) and information collected from the order instituting an informational proceeding (Order Number 12-1114-6). These issues include:

- Challenges with the program's ability to ensure installation defects are addressed and consumers are protected against poor construction practices.
- Raters conducting poor quality or noncompliant FV&DT.
- Providers' inconsistent and inadequate discipline of raters' misconduct and underperformance.
- Failure of providers to respond to data requests by the CEC.
- Providers not performing required quality assurance.
- Conflicts of interest among providers, raters, rater companies, and contractors.
- Lack of adequate oversight and enforcement by the CEC.

The changes proposed in this staff report focus on conduct, responsibility, and quality assurance for FV&DT providers and raters, as well as increased oversight by the CEC to improve program performance and protect consumers. The CEC intends to update the Energy Code with these proposed changes to implement improvements to the FV&DT program. Table 1 summarizes the specific issues and the corresponding changes proposed by staff.

Table 1: Summary of Issues and Proposed Resolutions

Category	Issue Summary	Proposal
Regulatory Alignment	<ul style="list-style-type: none"> • Regulations for FV&DT are inappropriately located outside the Energy Code. • The data collection and access requirements are codified in many documents, most of which are associated with the Energy Code. 	<ul style="list-style-type: none"> • Add requirements for FV&DT program to the Energy Code (Title 24). • Consolidate the data access and gathering requirements into the Energy Code.
Progressive Discipline	<ul style="list-style-type: none"> • Rater companies are not adequately regulated • Lack of discipline options to address performance issues • Data falsification 	<ul style="list-style-type: none"> • Include rater companies in regulations. • Provide progressive discipline options to correct noncompliant behavior. • Provide additional data entry safeguards.
Quality Assurance Procedures	<ul style="list-style-type: none"> • Insufficient quality assurance practices • Impractical quality assurance requirements 	<ul style="list-style-type: none"> • Establish new quality assurance tracking and reporting requirements. • Provide prescriptive alternatives to existing quality assurance procedures.
Conflict of Interest	<ul style="list-style-type: none"> • Evidence of a small number of raters, rater companies, and contractors with close relationships that jeopardize the integrity of the FV&DT program objectives. • Lack of clarity about legitimate off-purpose use of compliance documents 	<ul style="list-style-type: none"> • Define restrictions for rater companies to avoid incentives toward fraud and collusion. • Require rater companies to register a consent form signed by the building owner. • Require rater companies to provide a summary of results of FV&DT performed to the building owner. • Formally permit the legitimate off-purpose use of compliance documents.
Designation and Approval	<p>Raters have never been approved as special inspectors by local jurisdictions although the Reference Appendices indicate that they are to be considered as such.</p>	<p>Amend the Energy Code to remove the indication that raters are to be considered special inspectors.</p>
Training	<p>Training requirements are limited causing inconsistent programs between providers</p>	<p>Develop clear minimum training requirements including:</p> <ul style="list-style-type: none"> • Proctored online training and exams. • Hands-on training. • Increased initial oversight by the provider for new raters.

Category	Issue Summary	Proposal
Make Other Clarifying Changes	<ul style="list-style-type: none"> • Regulations do not define access to CEC data retrieval • Regulation details on reporting requirements is limited 	<ul style="list-style-type: none"> • Provide greater clarity on CEC access to data registry records. • Provide specific reporting requirements for greater clarity.

Source: CEC staff

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CHAPTER 1:

Legislative Criteria

Section 25402 of the Public Resources Code (PRC) directs the California Energy Commission (CEC) to prescribe, by regulation, building design and construction standards that reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy in newly constructed buildings and additions and alterations to existing buildings. These regulations are known as the Building Energy Efficiency Standards (Energy Code) and are contained in Parts 1 and 6 of Title 24 of the California Code of Regulations. The Energy Code was first adopted in 1976.

Section 25402 of the PRC also requires the CEC to update the Energy Code periodically and adopt any revision that, in its judgment, it deems necessary. The CEC adopts updates to incorporate new technologies and practices to increase the efficacy of the Energy Code following a three-year update cycle, which is referred to as the “triennial update.” Section 25402.1 requires local building departments to enforce the Energy Code and directs the CEC to establish enforcement procedures.

As part of prescribing the Energy Code, the CEC includes verification and testing requirements to ensure the construction of new buildings and additions and alterations to existing buildings comply with the Energy Code. In some cases, buildings elements (such as insulation) or equipment installations (such as air-conditioning systems) are tested by trained and certified individuals to verify compliance with the Energy Code requirements. Some data from these tests must be collected and submitted to a data registry approved by the CEC. Field verification and diagnostic testing (FV&DT) is the process for verifying, testing, and recording (using the data registry) building energy efficiency measures and is an important part of the efforts to promote the proper installation of these measures. FV&DT was also intended to provide quality assurance and consumer protection,¹ although these goals have not consistently been achieved.

1 PRC 25942(a)3

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CHAPTER 2:

Efficiency Policies

The Warren-Alquist Act establishes the CEC as the state’s primary energy policy and planning agency.² The act directs the CEC to “employ a range of measures to reduce wasteful, uneconomical, and unnecessary uses of energy, reducing the rate of growth of energy consumption, prudently conserve energy resources, and assure statewide environmental, public safety, and land use goals.”³ As part of accomplishing this mandate, the act requires the CEC to promulgate energy standards for newly constructed buildings and additions and alterations to existing buildings. The Energy Code is a unique California asset that has placed the state on the forefront of energy efficiency, sustainability, energy independence, and climate change issues and has provided a template for national standards and other countries around the globe.

Robust and effective FV&DT performed by independent third-party trained technicians is intended to support successful implementation of the Energy Code. CEC-approved Home Energy Rating System (HERS) providers are responsible for the training, certification, and direct oversight for these technicians (raters). FV&DT helps ensure that newly constructed buildings, additions, and alterations meet the intended energy performance, as well as provide quality assurance and consumer protection⁴ although these goals generally have not been achieved. Also, the corresponding data output may provide feedback on program effectiveness and planning for future building energy standards. For these reasons, the CEC seeks to make changes to improve performance and effectiveness of the FV&DT program.

The following legislation and executive orders are relevant to the objectives of the Energy Code FV&DT program.

Executive Order S-20-04 (Schwarzenegger, 2004)

Executive Order S-20-04 directed the CEC to collaborate with the California State License Board (CLSB) to ensure building and contractor compliance with the Energy Code.

Assembly Bill 32 (Núñez, Chapter 488, Statutes of 2006)

The landmark Global Warming Solutions Act of 2006 established a statewide greenhouse gas emissions limit equivalent to the statewide greenhouse gas emissions levels in 1990 to be achieved by 2020.

Assembly Bill 2021 (Levine, Chapter 784, Statutes of 2006)

2 “The [Warren-Alquist State Energy Resources Conservation and Development Act, Division 15 of the Public Resources Code, Sections 25000 et seq.](https://www.energy.ca.gov/rules-and-regulations/warren-alquist-act),” available at [_https://www.energy.ca.gov/rules-and-regulations/warren-alquist-act](https://www.energy.ca.gov/rules-and-regulations/warren-alquist-act).

3 Public Resources Code Section 25007.

4 California Energy Commission. February 2, 1999. “Initial Statement of Reasons, Establishment of California Home Energy Rating System Regulations.”

AB 2021 directs the CEC to investigate options and develop a strategic plan to improve the energy efficiency of air-conditioning systems and decrease the peak electricity demand of these systems. In response, the CEC convened a working group of professionals in the heating, ventilation, and air-conditioning (HVAC) industry to draft a strategic plan that would reduce California's peak-load growth while improving the business climate and level of quality workmanship in the HVAC industry.⁵

In its *Strategic Plan to Reduce the Impact of Air Conditioners*, the working group concluded that increases in the energy efficiency of air conditioners will not yield any significant increases in energy or peak savings unless known quality control problems in the HVAC industry are addressed.⁶ The strategic plan also stated "failure to ensure quality installations or maintenance of cooling systems result in a 20 to 30 percent increase" in energy use.⁷ A key strategy identified by the working group was to ensure that FV&DT protocols were used by installers and third-party verifiers to demonstrate that HVAC installations, including duct sealing, complied with and achieved the energy efficiencies of the Energy Code.⁸

Senate Bill 350 (De León, Chapter 547, Statutes of 2015)

Senate Bill (SB) 350 was approved by former Governor Edmund G. Brown Jr. as a call for a new set of objectives in clean energy, clean air, and pollution reduction for 2030 and beyond. These objectives include directing the CEC to establish targets to double energy efficiency by 2030. SB 350 also directs the CEC to "adopt, implement, and enforce a responsible contractor policy for use across all ratepayer-funded energy efficiency programs that involve installation or maintenance, or both installation and maintenance, by building contractors to ensure that retrofits meet high-quality performance standards and reduce energy savings lost or foregone due to poor-quality workmanship" (PRC 25943[a][3]). The CEC was also directed, in consultation with the California Public Utilities Commission, to "establish consumer protection guidelines for energy efficiency products and services" (PRC 25943[a][4]).

SB 350 recognizes that a major challenge to achieving additional energy efficiency savings is the energy savings lost or foregone due to poor-quality work resulting from contractors failing to meet minimum Energy Code and performance standards governing installations of energy efficiency measures.

Senate Bill 32 (Pavley, Chapter 249, Statutes of 2016)

SB 32 updated the Global Warming Solutions Act of 2006 to reduce the state's GHG emissions target to 40 percent below 1990 levels by 2030.

5 Messenger, Michael. June 2008. [*Strategic Plan to Reduce the Energy Impact of Air Conditioners*](#). California Energy Commission. Publication Number 400-2008-010, page 1.

6 Ibid., page 1.

7 Ibid., page 5.

8 Ibid., pages 7–8.

Senate Bill 1414 (Wolk, Chapter 678, Statutes of 2016)

SB 1414 directed the CEC, in consultation with the CSLB, local building officials, and other stakeholders, to approve a plan that will promote compliance with Part 6 of Title 24 of the California Code of Regulations related to the installation of central air conditioning and heat pumps. The CEC initiated a public proceeding, including workshops and written comment from stakeholders, in June 2018 to develop the SB 1414 plan. The focus of the plan is improving the quality of installation of residential HVAC equipment, particularly in retrofits, and FV&DT is critical in achieving compliant installations.⁹

The CEC responded to the requirements of SB 1414 in its 2021 Integrated Energy Policy Report volume on building decarbonization with the following recommendations:¹⁰

- Expand the authority, responsibility, and resources of the CSLB to identify and take disciplinary action with higher consequences for (1) licensed contractors who fail to pull permits and fail to meet CEC quality installation standards for heating and air conditioning projects and (2) other persons who complete such projects without a license to do so.
- Require distributors to sell HVAC equipment only to licensed contractors and report to the CEC the number of equipment units sold to each purchaser.
- Work with manufacturers and distributors to ensure warranty registrations include the permit number for the equipment installation and warranty claims require permits to have been pulled for the installation.
- Require all permits record the license number of the installing contractor.
- In coordination with California Air Resources Board (CARB) and the U.S. Environmental Protection Agency, take action to ensure refrigerants are properly recaptured and recycled upon equipment replacement.
- Consider alternatives to demonstrate compliance with the CEC's quality installation standards, including participation in utility programs that verify quality installation, verified use of remote quality control monitoring systems, and installation of fault detection and notification equipment.
- Encourage simplification of building department permitting and inspection for heating and air-conditioning system replacement installations, including online permitting and remote inspections.
- Encourage training for contractors and technicians to properly meet quality installation standards and refrigerant recapture and recycling procedures.
- Encourage consumer protection information regarding the benefits of quality and code compliant installation be provided to persons for whom space heating and air conditioning is installed.

9 SB 1414 (Wolk, Chapter 678, Statutes of 2016), Senate Floor Bill Analysis, August 23, 2016.

10 Kenney, Michael, Jacob Wahlgren, Kristina Duloglo, Tiffany Mateo, Danuta Drozdowicz, and Stephanie Bailey. 2022. *Final 2021 Integrated Energy Policy Report, Volume I: Building Decarbonization*. <https://efiling.energy.ca.gov/GetDocument.aspx?tn=241599> California Energy Commission. Publication Number: CEC-100-2021-001- V1, page 58.

Assembly Bill 3232 (Friedman, Chapter 373, Statutes of 2018)

AB 3232 stated the intention of the Legislature to achieve significant reductions in greenhouse gas emissions by the state's residential and commercial building stock. The law directs the CEC to, in consultation with the California Public Utilities Commission (CPUC), the CARB, and the California Independent System Operator (California ISO or ISO), assess the state's potential for reducing greenhouse gas emissions in its residential and commercial building stock by at least 40 percent below 1990 levels by January 1, 2030. The CEC published the *California Building Decarbonization Assessment* in 2021 that found that electrification coupled with efficiency are key strategies to decarbonizing California's buildings.¹¹

Executive Order B-55-18 (Brown, 2018)

This executive order established California's principal climate change directive to achieve carbon neutrality¹² in all sectors of the state as soon as possible, and no later than 2045, and maintain and achieve negative emissions thereafter.

Executive Order N-19-19 (Newsom, 2019)

Executive Order N-19-19 called for a concerted commitment and partnership by government, the private sector, and California residents to reach some of the strongest climate goals in the world. It required every aspect of state government to redouble its efforts to reduce greenhouse gas emissions and address the impacts of climate change while building a sustainable, inclusive economy.

11 Kenney, Michael, Nicholas Janusch, Ingrid Neumann, and Mike Jaske. 2021. [California Building Decarbonization Assessment](https://www.energy.ca.gov/publications/2021/california-building-decarbonization-assessment). California Energy Commission. Publication Number: CEC-400-2021-006-CMF. <https://www.energy.ca.gov/publications/2021/california-building-decarbonization-assessment>.

12 Carbon neutrality is the point at which the removal of carbon pollution from the atmosphere equals or exceeds emissions.

CHAPTER 3:

Background on the FV&DT Program

Program Development

Beginning in the latter part of the 1980s, concerns were raised regarding construction and installation defects of energy-efficient equipment. For example, field research conducted by Lawrence Berkeley National Laboratory (LBNL) in 1989 demonstrated major inadequacies in the design, installation, and sealing of heating and air-conditioning ducts that, conservatively, wasted 30 to 40 percent of the conditioned air of a home.¹³ This waste severely impaired the energy efficiency of heating and air-conditioning equipment. Also, numerous studies and technical papers published between 1990 and 1998, many of them focused on California, demonstrated that improvement in the installation of central air conditioners and heat pumps would have major positive impacts on energy efficiency and nonenergy benefits, such as improved comfort, reduced maintenance costs, and longer equipment life.¹⁴ These studies concluded that installation quality improvements could achieve about 30 to 40 percent energy savings and 15 to 30 percent peak demand savings, reducing consumer energy bills accordingly.¹⁵

In the 1990s, PRC Section 25942 directed the CEC to develop and implement a voluntary Home Energy Rating and Labeling Program (Home Energy Rating System or HERS) to assist homebuyers and others in understanding the energy performance of their homes.¹⁶

Starting in 1995, the CEC began developing the HERS Program seeking to establish basic administrative procedures and a “whole-house” rating system. In that same period, construction defect litigation related to many different construction characteristics became a major problem for California builders, resulting in liability insurance becoming extremely expensive or unavailable and causing a major downturn in construction for multifamily

13 Modera, M. P., et al. 1989. [“Residential Duct System Leakage: Magnitude, Impacts, and Potential for Reduction.”](https://www.aivc.org/sites/default/files/airbase_3618.pdf) Lawrence Berkeley National Laboratory, VA-89-5-5, https://www.aivc.org/sites/default/files/airbase_3618.pdf.

14 Proctor, John, Chris Neme, and Steve Nadel. 1999. [National Energy Savings Potential from Addressing Residential HVAC Installation Problems](https://www.proctoreng.com/dnld/NationalEnergySavingsPotentialfromAddressingResidentialHVACInstallationProblems.pdf), p 21. <https://www.proctoreng.com/dnld/NationalEnergySavingsPotentialfromAddressingResidentialHVACInstallationProblems.pdf> (citing, among other studies, Hammarlund, Jeff et al., “Enhancing the Performance of HVAC and Distribution Systems in Residential New Construction”, Proceedings of 1992 ACEEE Summer Study on Energy Efficiency in Buildings, Volume 2, pp. 85-87, Proctor, John, “Pacific Gas and Electric Appliance Doctor Pilot Project”, Final Report Summer 1990 Activity, January 8, 1991, and Proctor, John and Ronald Pernick, 1992a, “Getting It Right the Second Time: Measured Savings and Peak Reduction from Duct and Appliance Repairs”, Proceedings of 1992 ACEEE Summer Study on Energy Efficiency in Buildings, Volume 2, pp. 217-224.)

15 Ibid at p. 16.

16 Public Resources Code Section 25942.

housing.¹⁷ A major remedy that was proposed for reducing litigation problems was the use of third-party inspectors to ensure construction defects were avoided or corrected.¹⁸

The California Building Industry Association strongly advocated that the HERS Program be used to establish a third-party verification process to check that energy efficiency measures prone to construction/installation defects do not waste energy. A third-party approach was necessary because the cost of the test equipment and the time required to use it to verify quality performance were beyond the resources of local building departments. This approach was also supported by the California Building Officials (CALBO), the statewide building official organization that promotes public health and safety in building construction through responsible building code development.

The CEC decided to develop the HERS Program using raters for two key services:¹⁹

- (i) FV&DT consistent with the California Building Energy Efficiency Standards, Title 24, Parts 1 and 6.
- (ii) Whole-House Home Energy Ratings of newly constructed and existing homes.

In 1999, CEC promulgated regulations in the California Code of Regulations (CCR), Title 20, Sections 1670 *et seq.*, which established the administrative procedures of the HERS Program that were jointly applicable to both services. To address the construction defect problems in California, the CEC decided to develop the HERS Program in two phases, prioritizing first the development of procedures for FV&DT for certain Energy Code measures and, second, the development of procedures for whole-house ratings, which were adopted in 2008.²⁰

Program Challenges

The following background provides further information on some of the challenges of the Energy Code FV&DT program.

Rater Complaint and Investigation

On February 13, 2012, raters who had been decertified by a CEC-approved provider filed a complaint with the CEC.²¹ The subsequent investigation conducted by the CEC committee revealed the provider involved had an “unrefined, informal, and seemingly improvised

17 California Building Industry Association. SB 800 The Homebuilder, “FIX IT” [Construction Dispute Resolution Law](http://paladinriskmanagement.com/wp-content/paladindocs/6_may_09_g000035.pdf). 2003 http://paladinriskmanagement.com/wp-content/paladindocs/6_may_09_g000035.pdf, Kroll, Cynthia et. al., [“The Impact of Construction-Defect Litigation on Condominium Development.”](http://www.novoco.com/sites/default/files/atoms/files/defect_litigation_effects.pdf) Cal. Policy Research Center Brief Vol. 14, No. 7 October 2002, University of California, p. 2, https://www.novoco.com/sites/default/files/atoms/files/defect_litigation_effects.pdf, San Diego Association of Governments, 2001, [Condominium Construction Defect Litigation and Affordable Housing](https://www.sandag.org/uploads/publicationid/publicationid_146_576.pdf) p. 6, https://www.sandag.org/uploads/publicationid/publicationid_146_576.pdf.

18 California Building Industry Association. SB 800 [The Homebuilder, “FIX IT” Construction Dispute Resolution Law](http://paladinriskmanagement.com/wp-content/paladindocs/6_may_09_g000035.pdf). 2003 http://paladinriskmanagement.com/wp-content/paladindocs/6_may_09_g000035.pdf

19 California Energy Commission. Initial Statement of Reasons. California Home Energy Rating System. February 2, 1999.

20 Ibid.

21 California Energy Commission Adoption Order. 2012. [“Complaint Against and Request for Investigation of CalCERTS, Inc.”](https://efiling.energy.ca.gov/GetDocument.aspx?tn=65912) <https://efiling.energy.ca.gov/GetDocument.aspx?tn=65912>.

discipline and decertification process.”²² The committee further noted, “The process lacks features such as published written procedures and full and complete discipline-related notices.”²³ The committee noted that the regulations, as currently drafted, do not provide a clear process or detailed requirements for discipline.²⁴

Implementing the OII Proceeding

On November 14, 2012, the CEC adopted an order instituting investigation (OII), whereby all stakeholders and other interested persons were invited to participate in collecting information necessary to help improve the HERS and FV&DT programs, including those identified in the complaint investigation.²⁵ The OII covered the adequacy of the provider’s quality assurance program and related rater disciplinary procedures, rater decertification and disciplinary action by providers, adding the regulation of rater companies, and adequacy of conflict of interest regulations.²⁶

Workshops and Webinars Completed During the OII Proceeding

On March 6, 2013, the CEC conducted a lead commissioner workshop to solicit stakeholder input on improving the HERS and FV&DT programs, including topics identified in the OII.²⁷ Staff also added provider certification categories as part of the workshop discussion. Many issues were reviewed, and the discussion of provider quality assurance was extensive.²⁸

In subsequent public workshops and webinars, the CEC conducted topic-specific discussions to obtain comments from stakeholders on specific rules and potential changes to the regulations. The following is a list of public engagement efforts that were part of the OII proceeding:

- On July 26, 2013, the CEC conducted a discussion of rater disciplinary action to get specific input from providers on creating a uniform disciplinary process and establishing guidelines for the probation, suspension, and decertification of raters.
- On August 20, 2013, the CEC conducted a discussion on provider quality assurance to gather information on the provider quality assurance process and potential improvements to quality assurance requirements in the regulations.
- On September 10, 2013, the CEC discussed the roles and responsibilities of rater companies.

22 Ibid.

23 California Energy Commission Adoption Order. 2012. [Complaint Against and Request for Investigation of CalCERTS, Inc.](https://efiling.energy.ca.gov/GetDocument.aspx?tn=65912) pp. 14-15, [https://efiling.energy.ca.gov/GetDocument.aspx?tn=65912.](https://efiling.energy.ca.gov/GetDocument.aspx?tn=65912), pp. 14-15, [https://efiling.energy.ca.gov/GetDocument.aspx?tn=65912.](https://efiling.energy.ca.gov/GetDocument.aspx?tn=65912)

24 Ibid.

25 California Energy Commission Order Instituting Informational Proceeding. 2012. “[Regulation of Home Energy Ratings for Residential Dwellings](https://www.energy.ca.gov/sites/default/files/2020-10/2012-10-31_OII_12-HERS-01_ADA.pdf),” Docket No. 12-HERS-1, https://www.energy.ca.gov/sites/default/files/2020-10/2012-10-31_OII_12-HERS-01_ADA.pdf.

26 Ibid.

27 “[Transcript of Workshop on Regulations of Home Energy Rating Programs](https://efiling.energy.ca.gov/GetDocument.aspx?tn=2941-0&DocumentContentId=10992),” Docket No. 12-HERS-1, TN# 2941-0, [https://efiling.energy.ca.gov/GetDocument.aspx?tn=2941-0&DocumentContentId=10992.](https://efiling.energy.ca.gov/GetDocument.aspx?tn=2941-0&DocumentContentId=10992)

28 Ibid.

- On November 18, 2013, the CEC discussed with raters provider quality assurance issues, the rater disciplinary process, and rater companies.
- On March 10, 2015, the CEC conducted a webinar to refresh the OII proceeding efforts. Stakeholders indicated that provider quality assurance was still one of the key issues needing attention.
- On May 12, 2015, the CEC held a public workshop to continue discussing key issues with stakeholders.
- On July 9, 2015, the CEC held a workshop to discuss provider quality assurance issues. Subjects discussed included: quality assurance quotas per measure, clarifying what qualifies as a failure for each measure, exploring alternative quality assurance processes, exploring remote field verification, and developing uniform quality assurance processes for providers.

Since these public workshops, staff has undertaken several investigations, analyses, and efforts to uncover the contributing factors and the underlying cause of the endemic problems with the FV&DT program.

Effectiveness of FV&DT on Reducing HVAC Defects

In September 2017, a report published on behalf of the CPUC assessed state permitting and compliance rates for specific HVAC equipment replacement installations in California homes.²⁹ This report assessed the effectiveness of the FV&DT process.³⁰ Survey findings indicated that one barrier associated with training for raters related to a lack of hands-on elements in the training for certain diagnostic tests.³¹ Survey results also indicated inconsistent knowledge among raters regarding which tests they are required to perform for specific installations.³² Researchers also found examples of deviations between the performance they measured in the field and the field verification documented by HERS raters that led them to conclude it is possible that some raters simply complete the required compliance forms without performing the required tests.³³

Complaints Against Providers and Raters

Over the years, staff has received complaints and been made aware of issues regarding the conduct of providers, raters, and rater companies consistent with many of the issues, findings, and concerns discussed above.³⁴ The complaints and issues raised have been handled through

29 CALMAC Study ID CPU0172.01, [2014-16 HVAC Permit and Code Compliance Market Assessment](https://www.calmac.org/publications/HVAC_WO6_DRAFT_REPORT_APPENDICES_VolumeII_22Sept2017.pdf), https://www.calmac.org/publications/HVAC_WO6_DRAFT_REPORT_APPENDICES_VolumeII_22Sept2017.pdf September 22, 2017.

30 Ibid. at pp. 79–86.

31 Ibid. at p. 83.

32 Ibid. at p.84.

33 Ibid. at p. 77.

34 For example, see page 24, “Transcript of Workshop on Regulations of Home Energy Rating Programs,” Docket No. 12-HERS-1, TN# 2941-0, <https://efiling.energy.ca.gov/GetDocument.aspx?tn=2941-0&DocumentContentId=10992>. (Discussing flaws in the QA program stemming from concerns about litigation that lead to homeowners not being notified of failed HERS tests.)

different approaches depending on the source, topic, and program effect. Following are the two main categories of common complaints regarding the conduct of HERS providers and raters exemplified by the *Modesto* and *Hawthorne* case studies, cited below:

- Actions by the rater resulting in false information submitted to the certified residential data registries (for example, rater did not correctly perform FV&DT, rater did not visit the project site or bring necessary equipment, or rater did not share any information with the homeowner after performing the FV&DT).³⁵
- Actions by the provider resulting in false information in the certified data registry's database (for example, provider did not respond to a complaint, provider did not perform quality assurance checks, provider failed to inform the homeowner of the results of a quality assurance check, or provider failed to correct the data submitted by the rater to the data registry as a result of a failed quality assurance check).³⁶

Data Errors and Falsification

Additional concerns of program shortcomings were found when CEC staff investigated whether to establish and maintain a central data repository.³⁷ After randomly sampling certain verification forms, CEC determined that up to 70 percent of the forms contained unrealistic or invalid data input by raters. This finding raises concerns with potential poor testing or falsification and supports the need for greater quality assurance, conflict of interest restrictions, and progressive discipline, further confirming various concerns raised during the 2013–2015 workshops discussed above.³⁸

Quality Assurance Program

The existing HERS regulations require a provider to oversee raters through quality assurance procedures. Providers are required to conduct a minimum number of quality assurance checks annually for each rater and the provider's system. However, providers have not implemented their quality assurance programs consistently.³⁹ Shortcomings include failure to meet the required 1 percent quality assurance rate, not following procedures included in their approved application, not consistently administering disciplinary action, and not reporting failed quality assurance checks.⁴⁰ Quality assurance is critical to the FV&DT program achieving the purpose of correcting poor-quality contractor work, so that energy savings can be realized from the

35 For case study examples, see California Energy Commission Staff Investigation, Report 1-01 2021-006 Modesto Complaint and California Energy Commission Staff Investigation, Report 1-02 2022-002, Hawthorne Complaint.

36 Ibid.

37 California Energy Commission Staff Investigation, Report 2-02 2021-1002, Provider QA

38 For example, see discussion by Mr. Nesbitt, HERS Rater, pages 54-57, Transcript of Workshop on Regulations of Home Energy Rating Programs," Docket No. 12-HERS-1, TN# 2941-0, <https://efiling.energy.ca.gov/GetDocument.aspx?tn=2941-0&DocumentContentId=10992>. (Candid discussion about pressure to falsify data.)

39 California Energy Commission Staff Investigation, Report 2-05 2022-1001, HERS Annual Reporting. For example, see also page 66-68, Transcript of Workshop on Regulations of Home Energy Rating Programs," Docket No. 12-HERS-1, TN# 2941-0, <https://efiling.energy.ca.gov/GetDocument.aspx?tn=2941->

40 Ibid

installation of energy efficiency measures and contribute to the achievement of California's greenhouse gas emission reduction goals. Effective quality assurance checks also help to build confidence that the program supports authorities having jurisdiction (AHJs)⁴¹ and protects consumers.

Further confirming concerns raised during the 2013-2015 workshops discussed above,⁴² CEC staff has received complaints from consumers about contractor-installed systems failing to perform as expected, as exemplified in the *Hawthorne* case study.⁴³ Although field research⁴⁴ consistently shows a high level of installation defects, HERS raters rarely report failures of contractor installations in field verification reports as observed by staff's initial review of the provider data registry information, and quality assurance inspections rarely, if at all, lead to disciplinary actions to correct rater performance problems when issues are discovered.⁴⁵

In light of these challenges, to protect consumers against poor construction practices, and to help realize the expected benefits of installed energy efficiency measures, CEC staff intends to improve the FV&DT regulations to ensure the following outcomes in the upcoming rulemaking:

- Raters perform complete, accurate, and fully compliant FV&DT.
- Providers perform thorough rater training and quality assurance checks and consistently and appropriately discipline raters for noncompliant FV&DT.
- Providers timely and completely respond to data requests by CEC staff.
- Potential conflicts of interest between providers, raters, rater companies, and contractors are identified and prevented.
- Consumers are protected against poor construction practices, and installation defects are identified by FV&DT so that contractors may correct them.

41 Authority having jurisdiction (AHJ) refers to the entire authority, not just the building department. For example the City of Sacramento is the AHJ while the Sacramento City Building Department is the local building department.

42 For example, see page 104, "Transcript of Workshop on Regulations of Home Energy Rating Programs," Docket No. 12-HERS-1, TN# 2941-0, <https://efiling.energy.ca.gov/GetDocument.aspx?tn=2941-0&DocumentContentId=10992>. (Description of "drive-by" audits where rating data was entirely falsified.)

43 California Energy Commission Staff Investigation, Report 1-02 2022-002, Hawthorne Complaint.

44 This research was performed by the Legislature and is part of the impetus for SB 350.

45 California Energy Commission Staff Investigation, Report 2-05 2022-1001, HERS Annual Reporting. See also pages 54-56, Transcript of Workshop on Regulations of Home Energy Rating Programs," Docket No. 12-HERS-1, TN# 2941-0, <https://efiling.energy.ca.gov/GetDocument.aspx?tn=2941-0&DocumentContentId=10992>. (Candid discussion of HERS Rater concerns about inadequate QA systems.)

CHAPTER 4:

Staff Proposal for Regulatory Framework

Goals for Program Rulemaking

In conducting this rulemaking, the CEC has two important goals, an administrative goal and a program performance goal. The administrative goal is to consolidate all regulations related to the FV&DT program into Title 24 to simplify compliance with the Energy Code and associated regulations. This will also allow alignment of future FV&DT program updates with the triennial update cycle of the Energy Code. Equally important is the program performance goal. Staff proposes to achieve improved program performance by addressing all areas that have been the sources of programmatic problems and complaints. Finally, the CEC intends to amend other sections as necessary for greater clarity.

To accomplish these goals, CEC staff has grouped program changes into eight areas:

1. Align the FV&DT program with Energy Code requirements.
 - a. Modifying the FV&DT Program name and nomenclature to be Energy Code Compliance (ECC) for clarity and to help separate it from the Whole House Program.
2. Add provisions for rater companies, which are not contemplated by the current regulations.
3. Add required conduct and progressive discipline for providers, raters, and rater companies.
 - a. Set forth progressive discipline for providers, raters, and rater companies for noncompliance.
 - b. Provide data entry triggers for progressive discipline.
 - c. Require compliance with conflict of interest, quality assurance, training, and other conduct provisions.
4. Add new ways for providers to conduct quality assurance.
 - a. Establish new quality assurance tracking and reporting requirements for AHJs, CEC, and other state agencies.
 - b. Provide prescriptive alternative quality assurance procedures for the provider to use in rater oversight.
5. Expand conflict of interest restrictions
 - a. Define restrictions for rater companies.
 - b. Require raters or rater companies to register a consent form signed by the building owner prior to starting any FV&DT work on the project site.
 - c. Require raters or rater companies to summarize for the building owner all completed FV&DT tests performed on the project site including the pass/fail results.

- d. Formally permit the legitimate off-purpose use of certificates of verification.
6. Modify requirements for rater training, testing, and oversight.
 - a. Proctored online training and exams.
 - b. Hands-on training.
 - c. Increased initial oversight by the provider for new raters.
7. Remove the designation of raters as special inspectors.
8. Amend other sections for greater clarity.

Staff Proposal

Align the FV&DT Program with Energy Code Requirements

Current Language and Reason for Change

As described in Chapter 3, Title 20's HERS regulations currently contain provisions on which the FV&DT program relies, such as the provisions governing certification and oversight of providers and raters and the performance of FV&DT functions. In addition, Joint Appendix 7 or JA7 of Title 24 currently contains references to the Title 20 HERS regulations. Staff believes removing these cross-references and overlapping provisions will simplify the implementation and oversight of the FV&DT program and improve the ability for stakeholders to comply with the FV&DT program's requirements.

Description of Changes

Staff proposes adding requirements that affect the FV&DT program to the Energy Code (Title 24), thereby having a self-contained FV&DT program within Title 24 and separating the mandatory FV&DT and the voluntary whole-house components of the HERS Program. This would ensure that the training, certification, and quality assurance requirements for raters could be revisited with each new triennial Energy Code cycle, allowing FV&DT requirements to be revised as needed to address changes to the Energy Code. This move will also allow for easier reference by consolidating all program requirements that are presently split between Title 20 and Title 24.

Staff proposes the following changes:

- Add all requirements that affect the FV&DT program to Title 24 by adding a new section in Title 24, Part 1.
- Revise the provisions in JA7 related to residential data registries (data registry) to remove reference to Title 20 regulations in Title 24 for FV&DT, such that data registries, and their functions, are clearly separated from Whole House functions.
- Remove all references to Title 20 HERS regulations from section 10-103 and JA7 of Title 24 and ensure that there are no remaining references to Title 20 HERS regulations found elsewhere in Title 24, Part 1 or Part 6, or other supporting appendices.
- Make other changes as necessary to achieve this objective.

Add Provisions for Rater Companies

Current Language and Reason for Changes

Rater companies were not contemplated when the FV&DT program was first established, and therefore the regulations currently do not identify or include requirements for rater companies. However, despite having no regulations governing them, rater companies have become significantly involved in FV&DT.

Most FV&DT ratings are arranged through rater companies.⁴⁶ Rater companies advertise for rating services, employ or contract with one or more raters, pay the provider registration fees, and handle client relations. Some owners of rater companies are certified raters; some are not. Over the years, these rater companies have expanded the services they offer directly to builders, contractors, and installers, including pulling and managing permits, conducting energy modeling, completing required compliance forms, and completing paperwork for tax credits and rebates. Rater companies can influence how ratings are conducted by their raters but remain outside CEC or provider oversight. The regulations do not address any potential conflicts of interest with rater companies and builders or contractors. The owner or manager of a rater company is not required to receive training from or be certified by a provider nor provide any reporting to the CEC. There is no regulatory guidance on how providers should deal with a rater company in the event of a quality assurance failure, or how a rater company must ensure the proper conduct and performance of its raters.

Staff has identified that the regulations should include provisions concerning rater companies in order to explicitly include them in the program and govern their conduct.

Description of Proposed Changes

Staff proposes the following provisions governing rater companies:

- A rater company would be defined as a company, partnership, or sole proprietor owned by, or that employs or contracts with, one or more raters certified by a provider to offer FV&DT services.
- A rater company would apply to a provider for certification as a rater company similar to the process for raters. Providers would then maintain a publicly available listing of all its certified rater companies, including contact information and current approval status. A rater company would maintain a publicly available list of its raters.
- A rater company would be responsible for ensuring its raters comply with FV&DT regulations, as well as all other applicable laws and regulations, when providing FV&DT services. At least one principal of the rater company would also need to hold an active rater certification issued by a provider.
- A rater company would have view-only access to the compliance documents of raters that are in any state of completion within the data registry and would not be permitted to change data entered into the provider data registry for any compliance document signed by a rater.

⁴⁶ California Energy Commission Staff Investigation, Report 2-06, 2R vs 3R Compliance Data Differences.

- A rater company would use the approved data registry user interface or an approved external digital data service⁴⁷ for data input into the approved data registry.
- A rater company would submit annual reports to the provider, including its contact details, principals and required licenses, list of raters, the total number of FV&DTs performed by jurisdiction, and the average cost of services charged for each type of verification performed. The provider would verify the rater company's information and annually report the information to the CEC. The provider's rater company annual report also must include an aggregated total and average of the cost of services provided across all rater companies. The cost of services information must be summarized by local jurisdiction and climate zone. At a minimum, all aggregated data will contain data from no fewer than three rater companies.

Add Conduct and Progressive Discipline for Providers, Raters, and Rater Companies

Current Language

Existing regulations in California Code of Regulations, Title 20, sections 1670 *et seq.*, identify and establish requirements for raters⁴⁸ and providers.⁴⁹

Existing regulations state that providers and raters must not knowingly provide untrue, inaccurate, or incomplete rating information or report rating results.⁵⁰ Providers and raters must also not knowingly accept payment or other consideration in exchange for reporting a rating result not conducted and reported in compliance with these regulations.⁵¹

Under the existing regulations, providers oversee raters by entering into agreements with rater applicants prior to the rater performing FV&DT services.⁵² Providers are also required to respond to and resolve complaints related to ratings and FV&DT services and reports.⁵³ CEC certifies providers on a triennial basis in alignment with the code cycle and oversee them "to determine whether the providers comply with the requirements of these regulations."⁵⁴ The CEC may revoke the certification of a provider if the CEC determines there is a violation of the regulations.⁵⁵ There are no provisions to discipline a provider other than decertification.

47 An external digital data service is a data transfer service approved by the CEC to operate in conjunction with an approved data registry that allows authorized users to transfer data from a digital data source external to the data registry as an alternative to the key-in data entry for registering compliance documents.

48 Cal. Code Regs., Title 20, sections 1671, 1672, 1673.

49 Cal. Code Regs., Title 20, sections 1671, 1672, 1673, 1674, 1675.

50 Cal. Code Regs., Title 20, section 1672.

51 Ibid.

52 Cal. Code Regs., Title 20, section 1673.

53 Ibid.

54 Cal. Code Regs., Title 20, section 1675.

55 Ibid. The process for revocation follows Cal. Code Regs., Title 20, sections 1233 *et seq.*

Reason for Changes

Staff has identified a need for updates to the regulations governing providers, rater companies, and raters to add progressive discipline for the three types of entities.

Many factors could allow registry users to enter erroneous or false information. CEC staff is aware through data discovery and complaints that builders, installers, and raters can potentially be motivated to supply false data in the interests of meeting production schedules or ensuring continued working relationships, for example.⁵⁶ Data falsification undermines the credibility of the FV&DT program and confidence in the ability of the program to ensure quality installation and compliance with the Energy Code to protect consumers.

The lack of a clear process or detailed requirements for discipline, including the limited enforcement options, of providers and raters to address the myriad of potential infractions—big or small—limits the effective regulation of those involved in FV&DT, the ability to correct inaccurate or incomplete ratings and data records, and otherwise ensure compliance with the program. Progressive disciplinary measures were discussed to provide an opportunity to influence provider behavior and encourage compliance with the FV&DT regulations prior to initiating the decertification process.⁵⁷ The OII Proceedings showed the need for a prescribed rater discipline process.⁵⁸ Otherwise, raters may be unfairly punished for minor (or even nonexistent) transgressions. Establishing consistent and clear discipline procedures will give the rater and provider the ability to address errors or transgressions in a reasonable and prescribed manner approved and overseen by the CEC. The current process also does not provide any opportunity for raters to respond to or to appeal a provider's conclusions regarding needed disciplinary actions and to provide evidence in support of the appeal.

Description of Proposed Changes

Staff proposes the following progressive discipline measures for providers, raters, and rater companies. The objective is not to eliminate providers, raters, or rater companies, but to address potential negative behaviors that may impact the effectiveness of the FV&DT program.

CEC-Provider Progressive Discipline

- The proposed additions will include progressive disciplinary actions for providers who violate the FV&DT regulations, including failure to comply with the quality assurance requirements, investigate or discipline raters, cooperate in a CEC complaint investigation, comply with data requests, or otherwise comply with any applicable law or regulation.
- CEC staff proposes a multi-step progressive disciplinary process for providers for failure to adhere to the requirements of these regulations. Typically, discipline progresses through each step described below. In the event of a severe violation, the proposed

56 California Energy Commission Staff Investigation, Report 1-01 2021-006 Modesto Complaint
California Energy Commission Staff Investigation, Report 1-02 2022-002, Hawthorne Complaint.

57 Order Instituting an Informational Proceeding 12-1114-6.

58 Ibid.

regulations include an additional option of proceeding immediately to suspension or decertification.

- Step 1: A formal notice of violation is issued to the provider and publicly posted describing the violation and any corrective action to be taken by the provider. This step includes the opportunity for the provider to respond prior to a final determination.
 - Step 2: Probation for a duration specified by CEC. This step includes the opportunity for the provider to respond prior to a final determination.
 - Step 3: Suspension, which may include the conditional or unconditional restriction of a provider's access to the report generator for all projects. The provider may respond to and appeal the suspension prior to its effective date.
 - Step 4: Approval to be a provider will be rescinded. The provider may respond to and appeal the rescission of approval prior to its effective date.
- These proposed disciplinary actions for providers also apply to the failure to respond to data requests or to provide the CEC access to the provider's databases and registries, including full access to view data and documents retained in the providers data registry or database, run queries, and download data and information.

Provider-Rater Progressive Discipline

The proposed additions will include progressive disciplinary intervention to correct rater performance issues. The provider would be required to inform other providers and the CEC of any progressive discipline it takes against a rater and list all field audit failures and disciplinary actions of a rater on the provider's website for six months.

A field audit failure or other violation for a rater at one provider will count as a failure or violation for that rater at all providers. A rater with disciplinary actions at one provider would be required to continue at the same disciplinary step at all providers. This would mean, for example, a rater that is on probation or suspension at one provider would be on probation or suspension at all providers.

Violations subject to progressive discipline include a 72 hour limit on the registration of certificates of verification following the actual date of the test. This limit would be a simple programming element for the data registries. Once a rater has registered a failed FV&DT for a project, that rater becomes the rater of record. Except under limited circumstances, only the rater of record is permitted to register subsequent passing tests to remedy the failed test. The CEC will verify compliance of all raters with these new requirements across all providers annually.

CEC staff proposes a multi-step progressive disciplinary process for raters by providers. Typically, discipline progresses through each step described below. In the event of a severe violation, the proposed regulations provide the additional option of proceeding immediately to suspension or decertification.

1. Step 1: A formal notice of violation is issued to the rater, rater company, and any affected property owner describing the violation and any corrective action to be taken by the rater. This step includes the opportunity for the rater to respond prior to a final determination.

2. Step 2: Probation for up to six months. This step includes the opportunity for the rater to respond prior to a final determination.
3. Step 3: Suspension, during which the rater will not be able to submit any new compliance documents or otherwise access the provider's data registry. The rater may respond to and appeal the suspension prior to its effective date.
4. Step 4: Decertification as a rater. The rater may respond to and appeal the decertification prior to its effective date.

Provider-Rater Company Progressive Discipline

Rater company progressive discipline has two major components. First, the rater company must ensure its raters comply with all disciplinary requirements imposed by the provider. Second, rater companies are subject to progressive discipline by the provider.

CEC staff proposes a multi-step progressive disciplinary process of rater companies by providers. Typically, discipline progresses through each step described below. In the event of a severe violation, the proposed regulations provide the additional option of proceeding immediately to suspension or decertification.

1. Step 1: A formal notice of violation issued directly to the rater company and any affected property owner describing the violation and any corrective action to be taken by the rater company. This step includes the opportunity for the rater company to respond prior to a final determination.
2. Step 2: Probation for up to six months. This step includes the opportunity for the rater company to respond prior to a final determination.
3. Step 3: Suspension, during which the provider will disable access to its registry for all raters of the rater company. The rater company may respond to and appeal the suspension prior to its effective date.
4. Step 4: Decertification as a rater company. The rater company may respond to and appeal the decertification prior to its effective date.

Add New Ways for Providers to Conduct Quality Assurance

Current Language

Existing FV&DT regulations state that providers must have a quality assurance program that includes the following:

- Quality Assurance Manager and Quality Assurance Reviewers
- Initial review for accuracy and completeness of at least the first five homes a rater performs after completing training
- Ongoing reviews of work being performed by the raters in the provider's registry⁵⁹

The one percent ongoing quality assurance reviews require providers evaluate "the greater of one rating, randomly selected or one percent of [each] rater's past 12 months total number of

⁵⁹ Cal. Code Regs., Title 20, section 1673, subdivision (i)

ratings for each measure tested by the rater.”⁶⁰ The providers must also conduct the same check on one percent of all ratings conducted through the provider, selected randomly from the provider’s entire pool of ratings on an ongoing basis.⁶¹ These field checks are performed by the providers independently repeating the rating to check whether the rating was accurately completed by the rater, and determining whether information was completely collected and reported.⁶² Field checks occur after the submission of the certificate of verification and are documented in the provider’s database.⁶³

Reason for Changes

At the end of each year, providers report all quality assurance actions to the CEC. Each year, these reports show that the providers do not meet their minimum quality assurance requirements. While there are many issues identified by the providers, the primary obstruction that can be out of the Provider’s control is that contacted homeowners refuse to allow quality assurance inspectors from the provider to enter the home and rerun the FV&DT.

Thorough and complete quality assurance is a vital component of the FV&DT program. As an example, quality assurance is particularly important when sampling is used for FV&DT ratings for larger housing developments. Under sampling, one home out of a group of projects (typically seven) is chosen for FV&DT. If the tested home passes, then the other homes in the sample group are deemed to pass. It is critical for the tested home to be reported by the rater if it does not pass FV&DT. The failed report determines that the other projects in the sample group may not pass as well, and that further FV&DT is needed to determine whether the other homes comply with the Energy Code. If a rater were to accidentally or intentionally falsely report that a noncompliant tested home passes FV&DT, this will likely mean other homes in the sample groups fail to comply without anyone’s knowledge or any opportunity for corrective action. Quality assurance evaluations for the homes that were not tested is the only means available to the FV&DT program to identify when raters cause projects in a sampling group to be falsely deemed compliant.

The regulations do not require that quality assurance reports be submitted to the homeowners (consumers), building departments, the CSLB, or builders, nor do providers voluntarily provide these reports to them. This lack of disclosure and transparency undermines the program. Failing to ensure that homeowners/consumers are properly informed of how these quality assurance evaluations are done and what the results are seriously disadvantages them and limits their ability to get resolution of poor installations and inaccurate ratings.

The CEC has received complaints about raters who walk through FV&DT visits without conducting required testing or who do not even go to project sites to conduct the required

60 Cal. Code Regs., Title 20, section 1673, subdivision (i)(3)(A). The regulations further provide that for raters that have had at least one quality assurance evaluation for any measure in the past 12 months, this evaluation shall be required to be done only for those measures that have been tested by the rater at least 10 times in the past 18 months. The amount of field measures increases when deficiencies are found. Cal. Code Regs., Title 20, section 1673, subdivision (i)(3)(C).

61 Cal. Code Regs., Title 20, section 1673, subdivision (i)(3)(A).

62 Ibid.

63 Cal. Code Regs., Title 20, section 1673 subdivision (i)(3)(C).

tests yet still submit compliance documents to registries.⁶⁴ It is critical for the CEC and providers to stop these problems from occurring. Building departments need to know when incorrect ratings have resulted in building departments incorrectly determining that projects comply with the requirements of the Energy Code. Furthermore, the CSLB needs to know when incorrect ratings may have been caused by contractor fraud or misrepresentation in violation of contractor license laws. Builders need to be informed about the actions of the rater and the consequences for their construction project.

Description of Proposed Changes

Staff proposes the following quality assurance procedures so that providers have a range of quality assurance methods available to them to achieve the required audits. Staff will seek more input from stakeholders through the rulemaking process so providers can perform the minimum required quality assurance in a cost-effective manner and meet the quality assurance and disclosure requirements. Staff proposes the following quality assurance measures:

- Onsite audits are performed by the provider following field verification and diagnostic testing by a rater. Onsite audits are performed at the invitation of the homeowner, through a complaint or other processes. They are also performed once a year for each rater. Additionally, they can be performed at the discretion of the provider or CEC. For an onsite audit the provider independently repeats the field verification and diagnostic test to determine if it was accurately performed and whether all data was accurately collected and reported by the rater and are included in an annual report to the CEC. The quality assurance reviewer will perform all FV&DT performed by the rater at the project site.
- "Shadow audits," where field audits are performed on the rater as they perform the FV&DT. The rater will be informed of the shadow audit requirement on the day of the audit, and the reviewer will explain their presence to the homeowner. Developers or contractors may not refuse a shadow auditor if sampling is being used. The shadow audit reviewer will provide a report of results to the rater and, if applicable the rater company, and issue a pass or fail based on the rater performance. Shadow audits are limited to audits of Quality Insulation Installation inspections.
- "Desk audits" based on the compliance documents within the provider's data registry. Providers will develop and document a maximum variance for each data entry point for each FV&DT based on its data registry and the professional judgement of its reviewers. The desk auditor will identify a project to audit where the rater in question provided FV&DT services. The desk auditor will pull all compliance documents associated with the project as necessary to audit the FV&DT performed by the rater at the project site and may contact outside authorities, such as the AHJ, at their discretion. The desk audit reviewer will confirm that the measurements, calculations, and other information obtained during FV&DT at the project are within expected tolerances. The reviewer will then compare the FV&DT results from the project site to no fewer than 20 other FV&DT

⁶⁴ California Energy Commission Staff Investigation, Report 1-01 2021-006, Modesto Complaint
California Energy Commission Staff Investigation, Report 1-02 2022-002, Hawthorne Complaint.

results performed by the rater on other project sites prior to the audited project. The reviewer will determine if the FV&DT results are copied from other project sites. If such trends are identified, additional project audits will be performed to determine the potential for fraud. The reviewer will provide a report of results to the rater and, if applicable, the rater company, and a pass or fail of the desk audit.

- Quality assurance tracking and reporting: The provider will send a report each quarter to the CEC summarizing all failed field audits. The summarized reports will be public information that the CEC may forward to building officials with enforcement jurisdiction in the rater's service area and the CSLB. The report will list the rater information, contractor information, address of the project, and code violations for each failed measure.
- Quality assurance triggers for exceeding the FV&DT registration limitation: Providers will increase the rate of their quality assurance audits when a rater has violated the FV&DT registration limitation and notifies the CEC of the incident.
- Sampling will have the following additional restrictions: For newly constructed residential developments, tested homes will be subject to the registration limit and at least one in seven of the rater-tested homes will be field quality assurance tested by the provider. This means every seventh sampling group registered by the rater will be subject to an onsite quality assurance inspection by the provider. The provider will perform the onsite audit at an untested home in the same sample-group being tested. If the provider is refused access to the development, all sample-groups for the development will be considered to fail the audit and will be rejected from the data registry with a notification to the CEC. If the provider is refused access to the development, the rater may also be subject to investigation and disciplinary action.
 - The CEC is proposing restricting sampling to developments that are larger than seven dwelling units. Further, the CEC is considering restricting existing homes (additions and alterations) from the sampling provisions altogether.

Expand Conflict of Interest Prohibitions

Current Language

The current regulations establish conflict of interest requirements for providers' and raters' conduct and responsibilities in the interest of consumer protection. The conflict of interest requirements are as follows:

1. Providers shall be independent entities from raters.
2. Providers and raters shall be independent entities from the builder and from the subcontractor installer of energy efficiency improvements field verified or diagnostically tested.

3. Providers and raters shall be independent entities from any firm or person that performs work on the home for a California Home Energy Audit or a California Whole-House Home Energy Rating,⁶⁵ California Code of Regulations, Title 20, section 1673(j).

The regulations define an “independent entity” as “having no financial interest in, and not advocating or recommending the use of any product or service as a means of gaining increased business with, firms or persons specified in section 1673(j).”⁶⁶ The regulations define a “financial interest” as “an ownership interest, debt agreement, or employer/employee relationship. Financial interest does not include ownership of less than 5 percent of the outstanding equity securities of a publicly traded corporation.”⁶⁷

Reason for Changes

Staff seeks to expand and clarify the conflict of interest prohibitions. The current conflict of interest language fails to clarify financial interests that may occur when the provider, rater, builder, or installing contractor is not an individual, but rather a business with principals who are responsible. They also fail to prohibit close familial relationships, which is commonly prohibited in conflict of interest protections in other fields. The current conflict of interest language fails to address conflicts involving rater companies (rater-employers).⁶⁸ Further, staff seeks to expand and clarify the definition of a financial interest, including removing the phrase “advocating or recommending the use of any product or service as a means of gaining increased business with [specified] firms or persons.”

As an example, during the fall of 2014, staff was made aware that raters were pulling permits on behalf of a contractor, which may constitute a conflict of interest. Even though the building owners are ultimately responsible for obtaining and closing a building permit, most rely on the contractors to manage the permits for a given project. Staff determined that the conflict of interest provisions concerning raters pulling permits for contractors are ambiguous.⁶⁹ Staff concluded that raters pulling permits do not necessarily constitute a conflict of interest under the current regulations. A letter from the CEC dated January 14, 2015, indicated that based on the information presented, there was no evidence to suggest that such an arrangement was sufficient to constitute a violation of the conflict of interest provisions of the regulations.⁷⁰ The

65 There is an exception that does not apply to raters performing FV&DT of newly constructed homes or alterations to existing homes to verify compliance with the requirements of Title 24, Part 6. The exception is for California Whole-House Home Energy Raters, who are working as or for a building performance contractor certified under a CEC-approved Building Performance Contractor program as part of a provider’s rating system as specified in section 1674(e) of the regulations and in the HERS Technical Manual, are not required to be an independent entity from the person(s) or firm(s) performing the work on a home.

66 Cal. Code Regs., Title 20, section 1671. California Home Energy System Program, Definitions.

67 Ibid.

68 California Energy Commission Staff Investigation, Report 2-02 2021-1002, Provider QA.

69 [Information Proceeding to Improve the Home Energy Rating System Program](https://www.energy.ca.gov/sites/default/files/2020-10/2012-10-31_OII_12-HERS-01_ADA.pdf), Docket 12-HERS-01, https://www.energy.ca.gov/sites/default/files/2020-10/2012-10-31_OII_12-HERS-01_ADA.pdf.

70 Ibid

CEC letter sought additional information for further consideration and for the CEC OII to improve the HERS Program.⁷¹

The issue of raters pulling permits on behalf of a contractor primarily affects alterations (mostly HVAC changeouts). The relationship in question is between the rater and the HVAC contractor. New home developers are typically not using permit pulling services for newly constructed buildings.

Stakeholders have argued that the practice of raters pulling permits violates the existing regulations.⁷² For example, some raters, rater-employers, and energy consultants offer discounted or “bundled” pricing for rating and permit pulling services. As a result, these entities tend to receive increased business from contractors.⁷³ Stakeholders argue that this practice violates the conflict of interest regulations because the raters offering bundled pricing for HERS rating and permit pulling services are advocating or recommending the use of a service as a means of gaining increased business with building contractors. As a result, the raters are no longer “independent entities” as defined in section 1671. In addition, provider training materials, which are approved by the CEC, prohibit raters from providing additional services to contractors and subcontractors.

However, there are many positive aspects to allowing a rater or rater company to apply for and obtain permits (as well as providing other services) for a contractor or builder. These include some raters and rater companies providing compliance training for contractors as well as correcting erroneous compliance documentation for the project. This improves code compliance and general acceptance of the Energy Code by contractors and builders.

To allow for the positive aspects of the rater-contractor relationship while also helping to curtail its exploitive aspects, staff proposes to require that the rater (or rater company) register a consent form that is signed by the building owner. Additionally, staff proposes that the rater (or rater company) provide the building owner with a summary of the FV&DT performed on the project site including their pass/fail status.

The conflict of interest requirements should be amended to make them clear and easy to understand. They should focus on tangible financial interests that should be avoided, add a prohibition on close familial and similar conflicts, and reduce the percentage of the outstanding equity securities excluded. Finally, provisions concerning rater companies should be added.

Description of Proposed Changes

Staff proposes the following changes to clarify conflict of interest restrictions:

- Expand the list of parties that providers and raters are to be independent from to be more inclusive of any person designing and installing measures, not just a builder and the installing subcontractor.

71 Letters to and from Attorney Brett Dickerson, [HERS Docket 12-HERS-1](https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=12-HERS-1), <https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=12-HERS-01f>

72 Mahoney, Gregory (CALBO CEC Advisory Committee, Chair) letter filed to the HERS Docket 12-HERS-1, TN#76178, September 25, 2015.

73 Ibid.

- Expand prohibited financial relationships between providers, raters, or rater companies and the builders, designers, or installers that receive FV&DT services. These financial relationships may include the following:
 - Financial relationships created by ownership agreements, debt agreements, and employee-employer relationships.
 - Stock or equity ownership for any direct or indirect investment worth \$2,000 or more, except for ownership of less than five percent in publicly traded companies.
- Prohibit FV&DT services for builders, designers, or subcontractors owned or operated by close familial relatives.
- Establish a list of prohibited activities that create an actual conflict or the appearance of a conflict of interest between the rater and contractor or technician performing work on a project site.
 - Raters and rater companies may not perform any construction on a project site for which a construction permit has been issued by an AHJ.
 - Rater or rater companies must register a consent form signed by the building owner prior to providing any FV&DT services.
 - Rater or rater companies must provide a summary to the building owner of the FV&DT services performed at the project site as well as their pass/fail status.
- Remove from the definition of a prohibited financial interest the provision “advocating or recommending the use of any product or service as a means of gaining increased business with [specified] firms or persons.”

Modify Requirements for Rater Training, Testing, and Oversight

Current Language

The current regulations require providers to conduct rater training, including classroom and field training, in analysis, theory, and practical application in several specified areas, including FV&DT requirements of the Energy Code.⁷⁴ Providers must require each rater applicant to take a CEC-approved written and practical test that demonstrates the applicant’s competence in all subjects specified in section 1673(a)(1).⁷⁵

Reason for Changes

Training

Training requirements have not been updated as the FV&DT program has been developed to support Title 24 compliance. As a result, training offered by the two current providers differs significantly and may not meet the needed rigor to ensure competency to perform required FV&DT of the increasingly complex measures being defined in the Energy Code.

⁷⁴ Cal. Code Regs., tit. 20, section 1671(a)

⁷⁵ Ibid.

The current training modules focus more on the theory of building science than on practical skills. Although the time required to complete provider offered training differs, it generally can be completed in less than 50 hours (online). Staff has reviewed the providers' training materials, submitted with their certification applications, and observed that the regulations should include more specific guidance for providers to provide more robust training on the skillsets needed to conduct FV&DT proficiently and to complete the compliance documentation accurately.

The current training modules are all online, self-guided, and self-paced.⁷⁶ There is no monitoring of new raters going through the online training process. It is not possible for CEC to determine that raters going through the training process adequately learn how to proficiently conduct FV&DT, how to read the compliance documents, or how to complete the compliance documentation just by sitting through several modules of self-guided videos. The training videos lack the detailed step-by-step procedures for conducting each FV&DT. The training platforms do not ensure the user is actively viewing content. Once the user clicks on the video, the countdown timer begins. Regardless of the playback experience (pause or allow to play), once the timer reaches zero, the rater applicant can click "Continue" to proceed to the next video or quiz. Most quiz and exam solutions can be found within the student manual by using a keyword search or within the video presentation. The quizzes may be attempted without limitation and allow the student to learn which answers are incorrect. The number of quiz questions allows for some variation as to which questions are presented with every attempt in addition to re-ordering the questions.⁷⁷ More questions would prevent the pass-by-elimination process. Some of the quiz questions are vague and confusing in that additional context could change the correct response from the intended. At the end of the module, there is a final exam that the user must pass to receive a completion certificate. The final exam is not proctored. The closest attempt at a controlled completion is that one provider limits the final online exam to three attempts, with a delay of two days before the student can make a fourth attempt.

Practical training differs between providers. Providers are required to qualify rater applicants to satisfactorily perform FV&DT ratings for at least one home in the presence and under direct supervision of the provider's trainer or quality assurance reviewer.⁷⁸ CEC staff is aware that one provider does not have a hands-on lab to demonstrate practical training and to perform the practical test. However, the provider's application stated that they are using an active project location for hands-on instruction, but these locations are not disclosed to the CEC at any time.

Provider Applications

The regulations do not provide any guidance on the types of applications for which providers can be certified. The regulations also do not state that a provider must be certified for all certification categories. This impacts the training available for raters and can have a deleterious impact on the program in general if builders cannot find certified raters for the

76 Ibid.

77 Ibid.

78 Cal. Code Regs., Title 20, section 1673(a)(1) and (7).

services that they need. Over the history of the program, providers have been approved for conducting only parts of FV&DT services required by the Energy Code, including:

- Prescriptive HVAC alterations for residential buildings.
- Newly constructed residential buildings.
- Newly constructed residential buildings and prescriptive HVAC alterations for residential buildings.
- Newly constructed residential and nonresidential buildings and prescriptive HVAC alterations for residential and nonresidential buildings.

A consumer who is looking to hire a HERS rater might be confused when a HERS provider is not certified for all FV&DT services. This confusion could also result in having a gap in coverage of provider oversight over one or more FV&DT rating services, leaving a part of the Energy Code FV&DT services unsupported.

On the other hand, significant investment is required to develop a provider data registry and conduct the other provider functions. Under the current regulations, new providers could become established with partial approval and an expectation to expand. By staging the application, prospective providers could better align their expected income with their initial investment costs regarding the developing a data registry, other software and databases specified in Title 20, a rating system, and training for all procedures and compliance forms under the applicable Energy Code. However, these application options are far from clear in the existing regulations, and at the very least the regulations need to specifically acknowledge that there are options available.

Description of Proposed Changes

Staff proposes the following changes to improve the training requirements:

- Staff recommends increasing the scope of training regarding “building science” and focusing on additional practical skills for determining the measures are properly installed and comply with the Energy Code. For example, training should be expanded in areas of design and installation of HVAC systems; building envelope vapor and energy transmission principles; and design strategies that will better assist raters to identify the cause of failed FV&DT.
- To complete certification, all raters must be trained in all FV&DT procedures.
- All training (online or in-person) is to be proctored and include a quiz at the end of the session.
- Training is to include videos that show step-by-step procedures for conducting all FV&DT services as detailed in Title 24, Part 6, Reference Appendix, Residential Appendix RA3 (RA3).
- Provider applications will include draft scripts and recorded voiceover files in addition to the presentation slides.
- Presentation materials will be indexed for content and associated code or regulation. Documents will be keyword searchable.
- Training videos will be reviewed by CEC staff and are subject to correction post approval.

- Hands-on training will be required for all FV&DT procedures and must be performed in a fixed or mobile laboratory under the control (either direct or by contract) of the provider. Video or online training may not be used in place of hands-on training.
- Raters that pass the training and certification testing will be granted a limited status as a rater until both of the following are satisfied within 90 days:
 - Satisfactorily perform one FV&DT in one home in the presence and under direct supervision of the provider’s trainer or quality assurance reviewer.
 - The provider has reviewed the rating documentation of the first five FV&DTs or home ratings conducted by new raters for accuracy and completeness.
- All raters must satisfactorily perform one FV&DT in one home or in the lab in the presence and under direct supervision of the provider’s trainer or quality assurance reviewer annually.
- Training for active raters will conclude with an exam and self-certification that the rater understands the updates.
- Providers will update training materials no less than every three years, matching the Energy Code’s triennial cycle, to ensure that the training materials remain consistent with the updated Energy Code.
 - Raters will continue to be required to become trained on the new materials and certified by the provider to offer FV&DT services under the new code cycle.
- Retroactive training will be offered to guide new raters on differences in the prior code to perform ratings on projects permitted under the prior version.

Staff also proposes to add or expand on the following training requirements:

- The Title 24 requirements found in section 10-103, “Permit, Certificate, Informational, and Enforcement Requirements for Designers, Installers, Builders, Manufacturers, and Suppliers.”
- The intended workflow for raters in the permitting and construction process.
- The provider’s quality assurance program and provisions for rater discipline. The program plan will include procedures, sample dialogue for different types of rater deficiencies, and a remediation flow diagram.
- Terms of the provider-rater agreement.
- Residential alterations and new construction requirements (per Title 24, Part 6).
- Sampling procedures (per Residential Appendix RA2).
- Hands-on training on protocols for all FV&DT measures (per Residential Appendix RA3).
- The provider’s registry interface and procedures.
- The provider’s testing protocols for written and hands-on exams.

Remove the Designation of Raters as Special Inspectors

Current Language and Reason for Change

The Energy Code, in Reference Appendix 2.1, currently states that raters should be considered as “special inspectors” by enforcement agencies. Title 24, Part 2 defines a special inspector as

“a qualified person employed or retained by an approved agency and approved by the building official as having the competence necessary to inspect a particular type of construction requiring special inspection.”⁷⁹ RA 2.1 also states that raters shall demonstrate competence, to the satisfaction of the building official, for the visual inspections and diagnostic testing that they perform. However, no AHJ (local building department) has approved or attempted to approve any rater as a special inspector or required a rater to demonstrate competence to their satisfaction to operate within its jurisdiction. Raters are trained and certified by providers as set forth in the program regulations without any other action taken by a building official.

Description of Changes

Staff proposes amending Residential Appendices RA2 and JA7 to remove the statement that HERS raters should be considered as “special inspectors,” and delete the authority of local building departments to determine whether raters are allowed to perform FV&DT in their jurisdiction, consistent with the current implementation of the FV&DT program.

Amend Other Sections for Greater Clarity

Staff proposes to amend the following sections for greater clarity:

Data Collection

Current Language and Reason for Change

Under the current regulations, providers are required to record and maintain for 10 years all required and optional data collected for a rating, as well as certain other information related to homes that received FV&DT.⁸⁰ Upon the CEC request, not more frequently than annually, the provider must submit to CEC these data and provide the CEC with ongoing access to the provider's database.⁸¹

The regulations do not define “access” or otherwise specify how CEC staff can retrieve the collected data and compliance documents. However, Joint Appendix 7 of the Energy Code is clear on how CEC should be granted access to the information in the registry. JA7.4.1 states providers “shall grant authorization to [CEC] staff to view the data and documents retained in the Data Registry and shall provide functionality that allows [CEC] staff to query and download retained data and documents.” CEC staff does not have the ability to run queries or download data from the data registries, and the current level of access allows only for narrow search and review of projects one at a time. Searches that result in fewer than 100 documents or 500 projects (depending on the HERS provider) must be assessed individually.

Description of Changes

To clarify the requirements in JA7.4.1, staff proposes the following changes:

- The CEC must have direct and consistent access to all provider data registries and quality assurance records for queries resulting in no more than 1,000 records.

79 Cal. Code Regs., Title 24, section 202.

80 Cal. Code Regs., Title 20, section 1673(e).

81 Ibid.

- The CEC may request query results that are expected to exceed 1,000 records or are more complex from the provider at any time.
- The provider will address any requested query from the CEC with either a direct submission of the requested data, a time frame by which the data can be compiled, or an explanation as to why the requested data cannot be provided for the CEC to consider.

Submission of Reports

Current Language and Reason for Change

Providers are required to maintain databases and submit annual reports to the CEC on FV&DT evaluation, quality assurance for unrated or untested buildings or installations, and its complaint response system.⁸² These reports enable CEC staff to evaluate provider compliance and the effectiveness of the program.

However, regulations for these annual reporting requirements do not provide much detail, which results in inconsistent reports in scope and level of detail produced by the providers due to varying interpretation of what information should be contained in the annual reports. For example, there are no minimum requirements on specific information that needs to be collected and stored in the provider's database for quality assurance verifications.

Description of Changes

Since CEC relies on reporting to determine program compliance and evaluate its effectiveness, staff proposes the following changes to clarify FV&DT and quality assurance reporting requirements and the corresponding information in the provider's databases that is the source for these reports:

- FV&DT reporting will include submitting registered documents to the CEC repository on a quarterly basis once the repository is approved by the CEC executive officer for implementation. Before that approval, the provider will submit a random sample of registered documents (10 percent or 500 homes, whichever is less) organized by climate zone as defined in Section 100.1(b) of the Energy Code.
- Providers will be required to maintain a database system to show the quality assurance and progressive discipline actions taken regarding each rater certified by the provider, including:
 - A summary of all quality assurance actions taken by the provider and the results of those actions.
 - Rater identification information, the rater company of each rater, and current certification status, including the status of any progressive discipline actions that the provider has taken.
 - A requirement of the provider to maintain detailed quality assurance records that are referenced in the database for better tracking but are not otherwise reported.

82 Cal. Code Regs., Title 20, section 1673, subdivisions (f) and (i).

- A provider's annual quality assurance reporting from the providers must include the summarized data tracked by the providers for all certified raters. Also, the CEC may request a copy of the detailed quality assurance records for individual raters.

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CHAPTER 5:

Alternatives Considered

Listed below are four options to address the issues in the HERS Program:

1. Do nothing.
2. Investigate elimination of the FV&DT program.
3. Add provisions related to FV&DT program to Title 24, including regulations to improve program clarity and compliance.
4. Reimagine the entire FV&DT program.

Option 1: Do Nothing

This approach is the least desirable option because it leaves the current regulations in place without addressing the issues identified throughout this staff report. This approach will result in continued problems with rater training, quality assurance and discipline by the providers, and continued limited ability for CEC staff to oversee the providers and enforce compliance with the FV&DT regulations. Staff does not recommend this option.

Option 2: Investigate Elimination of FV&DT Program

The problems with the FV&DT program are significant and long running. It is not unreasonable to question whether the FV&DT program is achieving the desired outcomes cost-effectively. Staff's current investigations of complaints and performance of the FV&DT program, as it is currently implemented, have raised serious questions about the ability of the program to consistently provide value and benefit to consumers that outweigh the costs. Some investigations have suggested that if verifications find that installations meet the requirements when they actually do not, the inaccurate verification report may be assumed to be valid, and actually may be detrimental to consumers, shielding contractors who perform poor installations and construction from scrutiny. Under this option, a targeted investigation could be conducted to determine the cost-effectiveness of FV&DT ratings and the value of these ratings to the consumer and AHJs. The outcome of the investigation may be a recommendation that the FV&DT program can be rehabilitated through rulemaking (see Option 3) or provide evidence to support a rulemaking to eliminate it entirely. The investigation could also examine the Energy Code to determine the effect of eliminating the FV&DT portion. One potential issue to be examined is the practice of using HERS ratings to verify building features claimed for compliance credit in software modeling.

A potential benefit of eliminating the FV&DT program, if determined appropriate, would be to lower the costs to consumers associated with new and existing residential projects. Contractors would become responsible for conducting all of the necessary FV&DT required by the Energy Code. Eliminating the FV&DT ratings would reduce construction costs by removing the third-party rater layer of regulation.

One drawback to this option is that it will require more time and resources than Option 4 to complete. Conducting an adequate investigation into whether the FV&DT program currently is

achieving the desired outcomes in a cost-effective manner would be time and resource intensive. It is unclear whether the investigation would support eliminating the program or updating it as in Option 3. Staff does not recommend this approach until Option 3 is pursued.

Another major drawback is the job losses caused by the elimination of rater jobs (currently estimated to be 900–1,000 raters statewide) and other jobs hosted by providers and rater companies. A final potential drawback are the unknown impacts associated with unwinding the FV&DT program regulations. Staff does not recommend this option.

Option 3: Add Regulations Related to the FV&DT Program to Title 24

This option involves adding all regulations affecting the FV&DT program to Title 24 and the complete separation of the FV&DT Energy Code verification program and the HERS whole-house home energy rating program.

Current FV&DT and HERS regulations allow the use of HERS raters to provide two key services: whole-house home energy ratings and FV&DT. Adding all of the regulations that affect the FV&DT program to Title 24 creates a logical separation between FV&DT and whole-house home energy ratings. This would also simplify the regulatory language for both services and allow regular updating of the requirements for FV&DT program as part of the Energy Code's triennial code update cycle.

Adding the regulations affecting the FV&DT program to Title 24 also offers an opportunity to improve the Energy Code field verification program with more robust requirements. This rulemaking should also include language changes to augment the minimum requirements for the quality assurance program and include additional oversight and enforcement tools for CEC staff as outlined in this staff report.

The main advantage of this approach is clarifying the fact that FV&DT and HERS are two separate programs that are each tailored to support a single key purpose and service, which will simplify each program and make them more manageable for stakeholders. The regular triannual update cycle of Title 24 also allows the FV&DT program requirements to evolve with the Energy Code without the need for an additional rulemaking. Staff recommends this approach, and this is the proposal discussed in this report.

Option 4: Reimagine the FV&DT Program

The last option would investigate the feasibility of altering the existing structure of the FV&DT program by re-assigning quality assurance functions from providers to independent entities or requiring that other services, such as compliance document processing through a registry, be done without charge as part of the rater agreements. Quality assurance functions would be delegated to independent third-party quality assurance providers that would need to be approved by the CEC and paid for by the providers. This change would be similar to how the Residential Energy Services Network (RESNET) quality assurance program design is conducted.

RESNET is a recognized oversight body for building energy efficiency rating and certification. RESNET is recognized by several federal government agencies (including the Internal Revenue Service, the U.S. Environmental Protection Agency, and U.S. Department of Energy), builders,

contractors, and industry organizations. Unlike the FV&DT program, which uses a single entity (the HERS provider) to train and oversee raters, RESNET has established two kinds of providers: quality assurance providers and rating providers. Quality assurance providers perform the quality assurance checks on the raters. The rating providers certify new raters and perform quality assurance oversight of the raters they certify.

This option could help all program elements to better meet the expected performance standards. The current FV&DT program structure combines ratings, FV&DT, and data registries, and this is problematic because providers rely on the raters and raters rely on contractors for economic reasons. A provider benefits financially from having a large number of certified raters performing work and charging customers for completed forms. As a result, there is no financial incentive for a provider to discipline a rater. An independent entity performing quality assurance evaluations may be less likely to allow improper FV&DT testing.

A significant disadvantage of this approach is unknown increases in complexity in the codes, the number of entities to be regulated, and the associated costs of implementing these parallel tracks to consumers and industry. While this option may represent an alternative approach to quality assurance, it is unclear whether the approach would comply with existing statutory requirements. Insuring compliance with existing statutory and regulatory requirements is a core purpose of this project proposal; because this alternative cannot feasibly attain a core purpose of this rulemaking proposal staff does not recommend it.

Staff Recommendations

The problems with the FV&DT regulations identified in Chapter 3 of this staff report make it difficult for the CEC to ensure that the providers create and implement a robust program that complies with applicable regulations. There is enough information on hand to justify immediate rulemaking to remedy the problems identified in Chapter 3 of this staff report. For this reason, staff recommends that Option 3 should be pursued, and that option is the subject of this staff report.

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CHAPTER 6:

Technical Feasibility

These proposals are the culmination of an extensive period of stakeholder workshops, reports, complaints, and CEC investigations. While staff has carefully considered these modifications, they have not been released to the public for comment. The proposed changes include primarily procedural changes with some changes to the provider data registries and conduct of progressive discipline and quality assurance. Staff concludes that the proposed changes are technically feasible.

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CHAPTER 7:

Savings and Cost Analysis

CEC staff proposes eight general categories of changes to the FV&DT program regarding the FV&DT regulations. This chapter will address cost and savings analysis related to these proposed changes and will include statewide impacts (in terms of costs and benefits, as well as cost-effectiveness) in connection with the CEC policies and affected parties. Economic and fiscal impacts will be discussed in another chapter. The impacts included are the best estimates that staff can make at the moment with currently available information. Staff seeks and anticipates further input from stakeholders during the rulemaking that will refine these estimates.

CEC Policies Considered

These CEC policies are discussed in greater detail in Chapter 2 of this staff report. Staff lists them again here as a reminder to the reader of the policies being considered for this analysis.

Executive Order S-20-04 (Schwarzenegger, 2004)

Executive Order S-20-04 directed the CEC to collaborate with the CLSB to ensure building and contractor compliance with the Energy Code. Improvements in the FV&DT program will help the CEC achieve better collaboration with the CSLB.

Assembly Bill 32 (Núñez, Chapter 488, Statutes of 2006)

The landmark Global Warming Solutions Act of 2006 established a statewide greenhouse gas emissions limit equivalent to the statewide greenhouse gas emissions levels in 1990 to be achieved by 2020. Any improvement in the FV&DT program will help achieve the California greenhouse gas emission goal.

Assembly Bill 2021 (Levine, Chapter 784, Statutes of 2006)

This strategic plan concluded that increases in the energy efficiency of air conditioners will not yield any significant increases in energy or peak savings unless known quality control problems in the HVAC industry are addressed. Persistent defects common in the installation of HVAC equipment and other energy efficiency measures must be corrected to achieve the energy savings necessary to accomplish the state's greenhouse gas reduction goals. Generally, any improvement in the FV&DT program will contribute to reducing the installation defects of HVAC systems in housing construction.

Senate Bill 350 (De León, Chapter 547, Statutes of 2015)

These objectives include doubling the energy efficiency savings in electricity and natural gas end uses of retail customers through energy efficiency and conservation. SB 350 called for major changes in achieving rapid greenhouse gas reductions through building energy efficiency. SB 350 recognized that a major handicap to achieving that reduction is the energy savings lost or foregone due to poor-quality work resulting from contractors failing to meet minimum Energy Code and performance standards governing installations of energy efficiency

measures. Again, any improvement in the FV&DT program will contribute to reducing the installation defects of HVAC systems in housing construction.

Senate Bill 32 (Pavley, Chapter 249, Statutes of 2016)

SB 32 updated the Global Warming Solutions Act of 2006 to reduce the state's GHG emissions to 40 percent below 1990 levels by 2030. Any improvement in the FV&DT program will help achieve the California greenhouse gas emission goal.

Senate Bill 1414 (Wolk, Chapter 678, Statutes of 2016)

SB 1414 directed the CEC, in consultation with the CSLB and other stakeholders, to approve a plan that will promote compliance with the Energy Code in the installation of HVACs and heat pumps. The HERS FV&DT verifications are critical to achieving compliant installations of residential HVAC equipment and were a central discussion in the work related to SB 1414. So, any improvement in the FV&DT program will help address the concerns raised in SB 1414.

Assembly Bill 3232 (Friedman, Chapter 373, Statutes of 2018)

AB 3232 directs the state to achieve a reduction in the emissions of greenhouse gases of 40 percent below 1990 levels by 2030 and requires the CEC to establish a comprehensive program to achieve greater energy savings in the state's residential and nonresidential building stock. Improvements in the FV&DT program will contribute to achieving the goals of AB 3232.

Executive Order B-55-18 (Brown, 2018)

This executive order established California's principal climate change directive to achieve carbon neutrality in all sectors of the state as soon as possible, and no later than 2045, and to maintain and achieve negative emissions thereafter. Any improvement in the FV&DT program will help achieve the California greenhouse gas emission goal.

Executive Order N-19-19 (Newsom, 2019)

Executive Order N-19-19 called for a concerted commitment and partnership by government, the private sector, and California residents to reach some of the strongest climate goals in the world and required every aspect of state government to redouble its efforts to reduce greenhouse gas emissions and mitigate the impacts of climate change while building a sustainable, inclusive economy. Any improvement in the FV&DT program will help achieve the California greenhouse gas emission goal.

Affected Parties

These parties are at least potentially affected by the staff proposed changes to the FV&DT regulations. All the parties considered are directly related to the compliance and enforcement of the Energy Code, with the exception of the consumers who are the primary benefactor of the Energy Code.

Consumers

Homeowners, both first-time buyers and existing owners, will be affected by increased costs of the FV&DT program that are passed down to them by the raters or contractors. Similarly, renters or lease holders are affected by these same costs that are likely to be passed down to them by the landlord. However, overseeing and effectively enforcing the FV&DT program benefits the state and public in many ways, most importantly by achieving the energy savings

envisioned by the Energy Code. These energy savings are important to all Californians to address global climate change, achieve the state's greenhouse gas emission reduction targets, and protect consumers against poor HVAC installations. Essentially, all consumers will benefit from improved compliance with the Energy Code and the part this plays in achieving the greenhouse gas emission reductions for California. Improvement of the FV&DT program that leads to increased compliance will have a positive long-term impact on consumers.

Authorities Having Jurisdiction

The CEC does not directly enforce the Energy Code. Only local building departments have the authority to enforce the California Building Code (Title 24, which includes the Energy Code). AHJs⁸³ are responsible for ensuring that the FV&DT verification tests are performed when required by the Energy Code. One of the objectives of the FV&DT program is to ease the burden on AHJs by providing a third-party, independent tester (rater), to verify the more complex requirements of the Energy Code. However, many AHJs do not enforce the Energy Code or verify that the FV&DT verifications have been performed prior to issuing a certificate of occupancy. A more reliable and defensible FV&DT program may encourage AHJs to enforce the FV&DT requirements, as well as the rest of the Energy Code requirements. All the staff-proposed changes may result in a change in costs from the perspective of the AHJ, but those changes will be minor and closely link to the AHJs policies while the benefit will be a more code-compliant construction.

Contractors, Builders, and Responsible Persons

Residential contractors affected by these changes will predominately be newly constructed home builders and existing building HVAC contractors. Contractors, builders, and those signing compliance documents as the "responsible person" (Title 24, Part 6, Section 10-103) that generally comply with the Energy Code regulations (and use the FV&DT program to complete the required verifications) will have little effect to the overall costs or procedures. Those builders who routinely circumvent the FV&DT verification requirements should experience a change in procedures as well as costs to comply with the Energy Code. If such speculative costs do increase, it is likely that the contractor will pass those costs onto the consumer.

Raters

The proposed revisions to the FV&DT regulations discussed in this staff report do not change the actual processes for performing FV&DT. However, the new proposed regulations will affect raters in terms of the progressive discipline, appeal process, new requirements for rater companies, quality assurance procedures, training requirements, conflict of interest prohibitions, and compliance document registration limits. While these changes represent an update to the procedures and oversight a rater will be subject to, the change in cost should be minimal.

83 The Energy Code uses the term enforcement agencies to include all entities with enforcement authority. A new term, authorities having jurisdiction, has in recent years been used by some to convey the broader set of entities who have enforcement jurisdiction; that term is used in this report.

Rater Companies

Rater companies will be affected by a new cost of compliance with the proposed regulations. Rater companies were not previously regulated. Rater companies would be subject to certification, training requirements, conflict of interest prohibitions, progressive discipline, and the appeal process. However, the cost of these requirements should be minimal because the requirements, although new, are not onerous. Essentially, the rater company will be required to register and report on an annual basis. Additionally, there are potential impacts from the progressive discipline of the raters employed by rater companies. Rater companies are required to support the progressive discipline programs for raters but are not required to significantly implement that program. The main requirement is for the rater company to ensure that the rater complies with the progressive discipline requirements.

Providers

The providers include two existing providers and any other entities considering submitting a new application to become a provider. The proposed changes are primarily procedural, requiring the performance and tracking of progressive discipline, certification of rater companies, changes to training, more tracking of rater activities, enforcement of conflict of interest, and quality assurance tracking and reporting requirements. However, while it is likely that many of these activities individually would not constitute a significant initial investment on the part of the provider, taken together they may.

Analysis

Staff proposes eight categories of changes to the FV&DT program. Within these eight categories, staff has identified those elements that may incur a cost or savings for either the considered CEC policies or affected parties. These costs or savings are estimates based on available information, staff experience, and certain assumptions as detailed in Appendix C.

Expected Sources of Costs or Benefits

1. Align the FV&DT program with Energy Code requirements
2. Add provisions for rater companies
3. Add progressive discipline for providers, raters, and rater companies
 - a. Set forth progressive discipline for providers, raters, and rater companies for noncompliance.
 - b. Provide data entry triggers for progressive discipline.
4. Add new ways for providers to conduct quality assurance
 - a. Establish new quality assurance tracking and reporting requirements for AHJs, CEC, and other state agencies.
 - b. Provide alternative quality assurance procedures for the provider to use in rater oversight.
5. Expand conflict of interest restrictions
 - a. Expand restrictions on conflicts of interests for providers and raters and establish the same restrictions for rater companies.

- b. Require raters or rater companies to register a consent form signed by the building owner prior to starting any FV&DT work on the project site.
 - c. Require raters or rater companies to summarize for the building owner all completed FV&DT tests performed on the project site including the pass/fail results.
 - d. Formally permit the legitimate off-purpose use of certificates of verification.
6. Modify requirements for rater training, testing, and oversight
 - a. Proctored online training and exams.
 - b. Hands-on training.
 - c. Increased initial oversight by the provider for new raters.
 7. Remove the designation of raters as special inspectors
 8. Amend other sections for greater clarity.

Staff will address the individual changes made to these requirements separately below.

Estimated Costs and Savings

Regulatory Alignment

Removing requirements governing the FV&DT program from the California Code of Regulations, Title 20 and adding requirements into the to the Energy Code (California Code of Regulations, Title 24) will not, in and of itself, have an impact on any of the potentially affected parties considered in this analysis. Staff will address the individual changes made to these requirements separately below.

Certified Rater Company

Rater companies will be required to be certified by a provider and complete initial rater company training on FV&DT program requirements, quality assurance, progressive discipline, and conflict of interest requirements. This initial training must not exceed eight hours. There is no expectation of significant training or other requirements for rater company certification. Therefore, the cost of this certification should be minimal. Staff estimates the cost of this training will be approximately \$90 per rater company based on similar industry training. Similarly, ongoing enforcement by providers of certification requirements should also be minimal, assumed to be no more frequent than on an annual basis. The proposed regulations include a requirement that one company principle be a certified rater. According to the websites of the existing providers, full rater certification costs either \$300 or \$2,500. Staff also anticipates there may be some savings attributable to the rater company certification requirements associated with an improved FV&DT program that will result in more accurate and complete verifications. Details of the cost calculations and assumptions are provided in Appendix C.

Progressive Discipline

There are three types of progressive discipline: (1) CEC-provider, (2) provider-rater, and (3) provider-rater company. The intent of progressive discipline is to correct bad behavior and only suspend or remove a party from the program as a last resort. The provider may charge a fee for disciplining raters or rater companies. The CEC anticipates that there will be initial costs

to discipline raters and rater companies as the improved quality assurance and discipline procedures are implemented, which should substantially decrease as the improved procedures become established.

Data entry restrictions and triggers for progressive discipline include limiting the timeframe when a rater can enter data into the data registry (3 days from the performance of the testing). This restriction would mean adding an additional data field to the provider data registry program (date of testing) and possibly an alert system for the provider when a rater has exceeded that limit. This represents an initial cost for the program feature. The ongoing procedural change would have a minimal cost, relying on the registry to alert the provider when action is needed, and progressive discipline procedures implemented. The limit would affect raters as well, but the result would be only that the rater needs to make sure that they registered their compliance documents in a timely manner. Again, staff anticipates some savings associated with an improved FV&DT program.

Based on staff estimates, the initial costs to the provider to set up the required internal procedures compliant with the proposed progressive discipline requirements should be no more than \$17,000 and take no more than three months to create. The on-going costs associated with the corrective actions that may be taken by the provider should be approximately \$21,000 annually assuming a rater (or rater company) audit failure rate of no more than 10 percent. The initial costs associated with the required programming changes to the provider data registry should be approximately \$25,000 and take no more than 160 hours to complete. While there may be costs to the raters or rater companies, those costs are not implemented by the proposed regulations and are completely under the control of the providers and are therefore considered speculative. Details of the cost calculations and assumptions are provided in Appendix C.

Quality Assurance

The proposed new quality assurance tracking and reporting requirements are primarily procedural. However, there will be initial costs to the provider and potentially some adjustments for the AHJs (although costs should be minimal or zero). Additionally, the tracking and reporting of quality assurance actions taken in respect to raters or rater companies will require the development or modification of a database system. These proposed changes will enable the AHJs (and other agencies) to better enforce the Energy Code without affecting costs or staff time. The costs to the provider will be procedural with only minimal initial costs.

The alternative quality assurance procedures for the provider to implement regarding rater activities will have an initial and ongoing cost to both the provider and the rater (and potentially the rater company). However, the costs to the provider and rater are associated with the consequences for noncompliance. For the provider, noncompliance with the minimum quality assurance requirements will result in progressive discipline actions. For the rater, noncompliance is expected to result in progressive discipline actions.

The proposed quality assurance reporting regulations may require that the providers modify their existing, or develop new, database systems to track and report quality assurance actions taken. The basic requirements of this database system would be as follows:

- Recording rater and rater company certification status

- Recording all disciplinary actions taken against each rater and rater company
- Recording all quality assurance audit results for each rater and rater company
- Reporting all failed quality assurance audits on a quarterly basis to the CEC
- Reporting all quality assurance actions taken for each rater and rater company on an annual basis to the CEC
- Reporting the decertification of any rater or rater company immediately to the CEC

Staff estimates the initial cost to the provider to set up the new internal procedures and quality assurance database compliant with the proposed quality assurance requirements to be approximately \$11,000 and should take no more than two months to complete. Staff estimates the on-going quality assurance costs to result in an annual savings of approximately \$500,000 to the provider when compared to the existing annual costs of quality assurance compliance required by the existing HERS regulations. While there may be costs associated with the quality assurance procedures for raters or rater companies, these costs are completely within the control of the provider and are not specified in the proposed requirements. Details of the cost calculations and assumptions are provided in Appendix C.

Conflict of Interest — Enforcement

The changes to the conflict of interest restrictions include minor restrictions for raters and rater companies. While there may be initial costs associated with these requirements for rater companies, staff estimates those costs would be minimal (if not zero) and the improvement to the reputation of the FV&DT program could be substantial. Also, allowing the use of certificates of verification for other purposes has already been shown to be a realizable and immediate source of additional income for rater companies. However, while staff estimates that the initial costs will not be substantial, those costs are completely under the control of the provider and are not specified in the proposed regulations.

Training

Rater Training Estimated Costs

The proposed changes to the training requirements are intended to add specific elements including proctored online training and exams, hands-on training, and increased initial oversight by the provider for new raters. These changes may have minor initial costs implications for the provider and rater. However, there should be no ongoing costs, and the improvements to the training will positively affect the FV&DT program.

Staff estimates that the initial (and one time) cost to develop compliant training for the new training requirements alone will be approximately \$11,000 and take no more than two months for the provider to complete. While there may be costs to the raters or rater companies, those costs are not mandated by the proposed regulations and are completely under the control of the providers. Details of the cost calculations and assumptions are provided in Appendix C.

Rater Company Training Estimated Costs

The proposed regulations include training for Rater Companies regarding the overall FV&DT process, parties, and their responsibilities. This training is restricted to no more than eight (8) hours but is far more likely to be accomplished in 30 minutes. While not a requirement of code, both existing providers use a learning management system (LMS) to disseminate training and testing. Staff assumes that the development cost will approximately \$10,000 per

hour of instruction plus 10 hours of oversight from the subject matter experts (\$155 per hour). Therefore, the range of one time development costs will be between \$7,000 and \$82,000. The ongoing administrative costs will be between \$750 and \$12,000 annually. Details of the cost calculations and assumptions are provided in Appendix C.

Designation and Approval (Special Inspectors)

The proposal is to amend the Energy Code to remove the designation of raters as “special inspectors.” Since the current implementation of the FV&DT program does not rely on the special inspector designation, staff has determined there will be little to no cost or savings from this change.

Amending Other Sections for Greater Clarity

By clarifying the data recording and reporting requirements, the CEC proposal benefits the providers and rater companies without affecting any other parties. These requirements are consistent with the existing reporting requirement with two exceptions: quality assurance reporting requirements (discussed above) and the new requirements for annual rater company reporting.

These requirements are feasible and give the provider and rater companies the certainty of knowing exactly what is expected. Clarifying requirements benefits businesses and the marketplace. Establishing clear requirements for all providers and rater companies allows them to avoid the cost of unnecessary development and implementation and encourages entry into the marketplace for greater competition by creating a consistent and fair playing field for all providers to compete. The annual rater company reporting requirements establish an annual report to be submitted by the provider based on data submitted to it by each of its certified rater companies.

The annual report will include the following elements (beginning in 2027):

- Data submitted to the provider by all certified rater companies or independent raters.
- For each rater company or independent rater:
 - compliance status of the principal licensure requirements
 - number of all types of certificate status for all raters employed by each rater company
 - indication of whether the total number of FV&DTs registered by each rater company and independent rater is accurate as compared to the provider data registry.
- An aggregation of the total and average costs of services for each type of FV&DT reported by all rater companies and independent raters without any associated identification. Cost of services is to be aggregated for each type of FV&DT and summarized by local jurisdiction and climate zone independently.

Staff estimates that the initial and on-going costs associated with the annual rater company reporting requirements will be approximately \$2,200 for each rater company or independent rater and an additional \$5,300 for each provider. Details of the cost calculations and assumptions are provided in Appendix C.

CHAPTER 8:

Environmental Impact Analysis

The proposed changes to the FV&DT program do not affect the efficiency measures required by the Energy Code. Rather, the proposed changes to the FV&DT program would help ensure that the Energy Code's provisions are properly implemented. As such, the proposed changes would help increase efficiency by reducing the frequency of inferior installations of HVAC and other energy-using residential equipment, reducing the need for fossil-fuel generation, and minimizing the impact of the electricity system, which in turn would minimize the impact of new construction on the environment and the climate crisis. Specifically, reduced energy consumption would translate to fewer power plants built and less pressure on the limited energy resources, land, and water use associated with energy production. In addition, lower electricity consumption results in reduced greenhouse gas and criteria pollutant emissions, primarily from reduced generation in natural gas power plants.

California faces numerous climate change-induced challenges from wildfires to heat waves to droughts, which all impact the safety and health of the state's residents, economy, and energy systems.⁸⁴ By reducing the need for fossil fuel and electricity consumption, the actions proposed in this report would have a beneficial impact on natural resources, including California's water supply and forests, as well as the health and safety of California's population. In this way, these actions are taken to assure the maintenance, restoration, or enhancement of one or more natural resources and to assure the maintenance, restoration, enhancement, or protection of the environment.

Furthermore, because the proposed actions will only increase proper implementation of the efficiency measures of the Energy Code, staff has concluded that they do not have the potential to have a significant effect on the environment. No unusual circumstances have been identified that could lead to the reasonable possibility that the activity will have a significant effect on the environment.

By ensuring proper implementation of the efficiency measures of the Energy Code, the proposed changes to the FV&DT program will also benefit consumers. The changes will enable customers to fully realize the efficiency savings of equipment installation (such as HVAC equipment) and efficiency measures (such as insulation) and will reduce overall energy consumption statewide, providing important air quality and climate benefits and reducing energy costs.

The proposed changes do not require the use of any specific materials to improve the efficiency and do not require any further implementation of energy efficiency requirements, as the savings come from improving installation of already-required energy efficiency measures for consumers.

⁸⁴ Final 2021 Integrated Energy Policy Report; Volume I: Building Decarbonization, at p. 1, Docket No. 21-IEPR-01, *available at* <https://efiling.energy.ca.gov/GetDocument.aspx?tn=241599>.

Finally, the proposed changes will also support information gathering activities that cannot lead to any major disturbance to an environmental resource. In addition to helping to improve statewide compliance with the Energy Code, the proposed changes will provide the state with more accurate information about the energy and water usage of buildings across the state. The proposed changes therefore support information gathering activities, including parts of one or more studies leading to action which the CEC, and/or other public agencies, have not yet approved, adopted, or funded.

CHAPTER 9:

Economic and Fiscal Impacts

This chapter evaluates the statewide economic and fiscal impacts that may result from the proposed changes to the FV&DT program. The analysis considers impacts to jobs, the creation or elimination of businesses, advantages or disadvantages to businesses, incentives for investment in California, incentives for innovative products, and benefits to health, safety, and welfare of California residents, as well as agencies and businesses. The costs and savings to individuals directly impacted by the proposed changes is covered in an earlier chapter, "Savings and Costs Analysis." Based on the evaluation in this chapter, neither the costs nor benefits associated with the proposed changes to the FV&DT program will exceed \$50 million. For this analysis, staff makes the following assumptions:

- The proposed changes to the FV&DT program will increase compliance with the Energy Code requirements by contractors and other licensed professionals.
- The proposed changes to the FV&DT program will increase enforcement of the Energy Code by AHJs.
- There are too few certified raters to provide all the required FV&DT verification services in the current market.
- Currently, at least 90 percent of alteration projects are completed without the benefit of permitting.⁸⁵
- A large portion of HVAC installations do not comply with the California Building Code (Title 24) and, in particular, do not comply with the Energy Code.
- There are some contractors who comply with the Energy Code except for FV&DT because it is not enforced by the AHJ.
- Many contractors at least offer to do work without benefit of permitting, and this practice will continue into the future regardless of the proposed changes to the FV&DT program.

Potential Creation of Jobs

The job markets considered are construction workers, construction contractors (including all trades), and the HERS raters. No other job markets are affected by the proposed changes to the FV&DT program. In California, there are currently about 900,000 construction-related

85 California Public Utilities Commission, [Final Report: 2014-16 HVAC Permit and Code Compliance Market Assessment \(Work Order 6\) Volume I – Report](https://www.calmac.org/%5C/publications/HVAC_WO6_FINAL_REPORT_VolumeI_22Sept2017.pdf), September 22, 2017. CALMAC Study ID: CPUC0182.01, Contract# 12PS5119 (HVAC WO6). https://www.calmac.org/%5C/publications/HVAC_WO6_FINAL_REPORT_VolumeI_22Sept2017.pdf

jobs,⁸⁶ 300,000 licensed contractors⁸⁷ and, as stated prior in this report, about 900 to 1,000 HERS raters.

Code compliance is the responsibility of the licensed contractor, as well as the other licensed professionals involved with the project such as the architect and engineer. Since the proposed changes to the FV&DT program are not new energy efficiency requirements and only encourage compliance with existing requirements, the effect to the creation or elimination of jobs in the contractor market should be minimal to the existing 300,000 licensed contractors in California.

Licensed contractors may use unlicensed workers to perform tasks on a job site. The creation and elimination of unlicensed worker-jobs are extremely cyclical in California. This cyclical pattern makes any effect from the proposed changes to the FV&DT program diminutive in comparison to the existing market forces to the point of being purely speculative.

To determine the approximate effect on rater job creations (job elimination is not expected), staff first will show the current market residential projects trend using 2020 data (most recent available) and the relative effect that raters have in that market.

Figure 1 (below) is based on data collected by the Construction Industry Research Board (CIRB). CIRB obtains building permit records directly from California AHJs each month to calculate new housing units and valuations (construction cost). CIRB has provided construction market statistical information regarding residential and commercial building permit data since 1954. Figure 1 shows the trend in residential construction for newly constructed buildings (single-family and multifamily), with the 2021 values forecasted. For 2020, Figure 1 shows that there were 57,784 single-family permits and 47,901 multifamily permits, for a total of 105,685 housing permits for newly constructed buildings. For 2020, the valuation of the single-family newly constructed buildings was approximately \$16.273 billion,⁸⁸ and multifamily was \$8.584 billion⁸⁹ for a total of \$24.857 billion. In terms of comparison, the alterations market for residential buildings was valued at \$5.374 billion⁹⁰ based on the permits pulled (452,952 alteration permits in CIRB data in 2020).

86 Simonson, Ken, chief economist, AGC of America. November 11, 2019. "[California Construction Outlook: Moving Ahead Despite Gradual Downshift.](https://www.mossadams.com/articles/2019/november/california-construction-outlook-for-companies)" Moss Adams, <https://www.mossadams.com/articles/2019/november/california-construction-outlook-for-companies>.

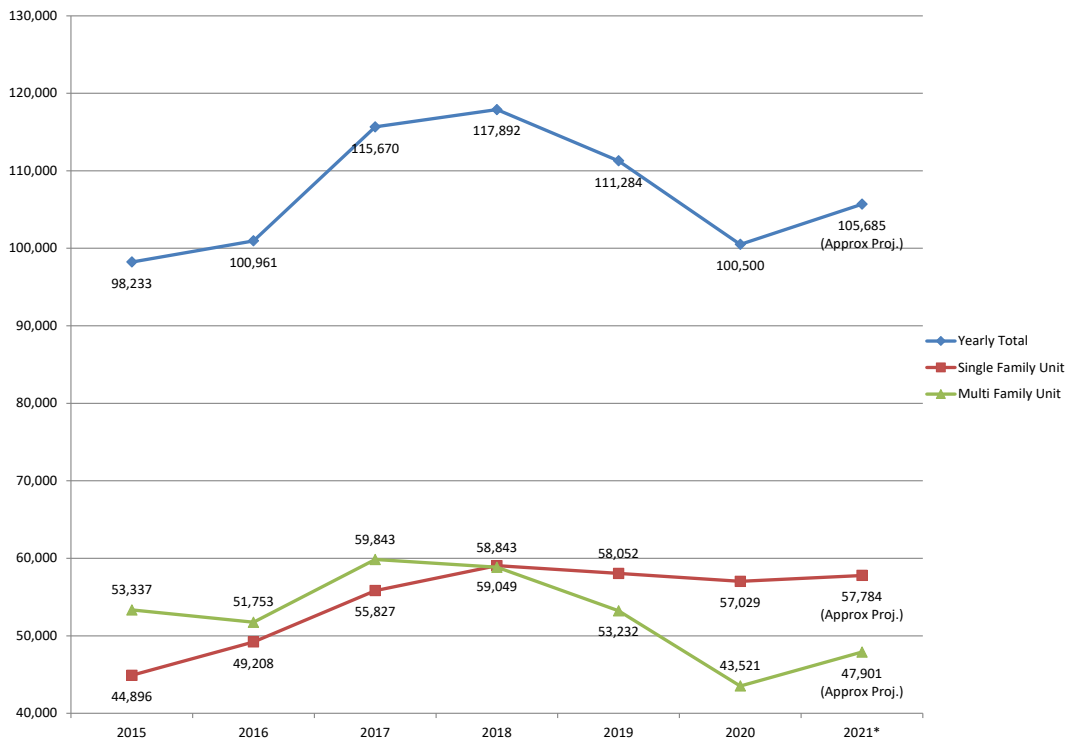
87 California Contractors State Licensing Board. June 1, 2022. "[History and Background,](https://www.cslb.ca.gov/About_Us/History_and_BackGround.aspx)" https://www.cslb.ca.gov/About_Us/History_and_BackGround.aspx.

88 Construction Industry Research Board. "CIRB Annual Building Permit Summary California Cities & Counties Data for Calendar Year 2020." [CIRB Home Page](https://www.cirbreport.org/), <https://www.cirbreport.org/>

89 Ibid.

90 Ibid.

Figure 1: California Newly Constructed Residential Production



Source: Construction Industry Research Board, CIRB Annual Building Permit Summary California Cities & Counties Data for Calendar Year 2020

From both existing providers, the total number of projects registering at least one FV&DT verification for newly constructed buildings in 2020 was 32,547,⁹¹ or less than a third of the permits pulled. For alterations, the total number of projects registering at least one FV&DT verification in 2020 was 123,039,⁹² which is also less than a third of the permits pulled. Also, through various market analyses performed (most recently for SB 1414), the rate at which alteration projects are permitted is still very low in California. Roughly only 10 percent of the alteration projects are completed with the benefit of permitting. This suggests that there is an unserved market for FV&DT services that exists now. Assuming the proposed changes will improve compliance and enforcement of the Energy Code requirements, staff would expect to eventually see a moderate increase in the number of persons seeking rater certification in the first year of implementation and continuing to increase in the years following.

Potential Creation of Businesses

Staff does not foresee the elimination of businesses because of the proposed changes to the FV&DT program, but there may be an increase in the number of rater companies. The proposed changes include a requirement that all HERS raters be employed by a rater company with an option for a rater to be self-employed. Staff has an incomplete picture of the employment status of all raters but estimates that half of them are employed by rater

91 Summary provided by CEC staff using the CCDR data as submitted by HERS providers for Calendar Year 2020 under the 2019 Energy Code.

92 Ibid.

companies that employ more than one rater. Staff assumes that most raters will want to continue in their current occupational status, but these new requirements may encourage some raters to start their own rater companies and employ those raters that would prefer to join a rater company.

Estimated Costs and Benefits

Costs of Implementation

The proposed changes to the FV&DT program include changes to oversight and data reporting, quality assurance, training, and conflicts of interest. The proposed changes to move the FV&DT regulations to the Energy Code and to eliminate the special inspector provision do not result in any substantive changes that would affect the cost of implementation for any parties. Most of the proposed changes are to procedures (such as progressive discipline) and result in minor speculative costs to implement. The primary cost of implementation will be from necessary modifications to the provider data registries to support the proposed changes. Staff estimates these costs to be well below \$1 million.

Benefits to Implementation

The intent of the proposed changes to the FV&DT program is to improve the implementation of the FV&DT program. The primary benefit of an improved FV&DT program is to the consumer in terms of health, safety, and welfare. Proper housing construction including envelope, HVAC, lighting, and domestic hot water creates a home that is energy-efficient and capable of providing safe living environment with improved indoor air quality and protection from extreme heat. The FV&DT program is intended to verify that these systems work and comply with the Energy Code. Therefore, while benefits to the consumer are expected, they are already accounted for with the implementation of the Energy Code itself.

CHAPTER 10:

Consumer Equity

Energy equity encompasses the equitable access to the benefits of energy infrastructure and equitable access to resources for energy improvement. This chapter discusses the economic and environmental benefits to low-income households and disadvantaged communities as a result of the proposed changes to the FV&DT program.

The FV&DT program is a statewide program intended to protect consumers (homeowner and ratepayers) from poor construction and installations practices common in the housing construction and equipment replacement market. For low-income and disadvantaged consumers, getting the most out of their investments into residential energy efficiency measures is extremely important. A 2016 study prepared with National Resources Defense Council⁹³ support shows that low-income households in some of the largest California metropolitan areas spend, on average, 7.2 percent of their income for energy. That amount is more than double the national median of 3.5 percent.⁹⁴ The report also shows that on average these low-income households paid a three times greater percentage of their income on energy bills, than higher income households.

The proposed changes to the FV&DT program intend to improve the FV&DT program, ensuring that the verifications provided by raters are true, accurate, and complete and that consumers received the energy savings they expected from their investments in energy efficiency measures.

93 The Natural Resources Defense Council is a 501(c)(3) non-profit international environmental advocacy group. The purpose of its work is to "safeguard the earth, its people, its plants and animals, and the natural systems on which all life depends," and to "ensure the rights of all people to the air, the water and the wild, and to prevent special interests from undermining public interests." Their stated areas of work include: "climate change, communities, energy, food, health, oceans, water, and the wild"

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ACRONYMS AND DEFINITIONS

Acronym/Term	Description/Definition
AB	<p>Assembly Bill.</p> <p>A proposed law, introduced during a session of the California State Assembly for consideration by the Legislature, and identified numerically in order of presentation.</p>
AHJ	<p>Authority having jurisdiction</p> <p>AHJs have the authority to issue building permits, perform building inspections, issue building citations, and issue certificates of occupancy. They are generally county, city, town building departments but may include state agencies as well.</p>
CAISO	<p>California Independent System Operator.</p> <p>The CAISO maintains reliability on the California power grid, and operates a transparent, accessible wholesale energy market.</p>
CARB	<p>California Air Resources Board.</p> <p>CARB is charged with protecting the public from the harmful effects of air pollution and developing programs and actions to fight climate change.</p>
CEC	<p>California Energy Commission</p> <p>The California Energy Commission is leading the state to a 100 percent clean energy future for all. As the state's primary energy policy and planning agency, the CEC is committed to reducing energy costs and environmental impacts of energy use while ensuring a safe, resilient, and reliable supply of energy.</p>
CIRB	<p>Construction Industry Research Board.</p> <p>CIRB research and compiles permitting data from building departments across California and has provided construction market statistical information regarding residential and commercial building permit data since 1954.</p>

Acronym/Term	Description/Definition
CPUC	California Public Utilities Commission is a state agency that regulates privately owned electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies, in addition to authorizing video franchises.
CSLB	California State Licensing Board. CSLB protects California consumers by licensing and regulating the state's construction industry. CSLB was established in 1929 and today licenses about 290,000 contractors in 44 different classifications.
Energy Code	Also known as the California Building Energy Efficiency Standards, including California Code of Regulations, Title 24, Part 6, and its implementing administrative provisions found in Title 24, Part 1, Chapter 10.
FV&DT	Field verification and diagnostic testing Tests performed and registered by raters in the provider data registry following the prescribed procedures in Title 24, Part 6 Residential Appendices (RA1-4).
HERS	Home Energy Rating System HERS is the California Home Energy Rating System as described in Title 20, Chapter 4, Article 8, section 1670. The HERS Program consists of providers that train and certify raters to perform whole house rating as well as field verification and diagnostic testing as a third-party to the contractor on a construction project. The providers and raters are responsible for registering the testing results in the provider's data registry.
HVAC	Heating, ventilation, and air conditioning is the use of various technologies to control the temperature, humidity, and purity of the air in an enclosed space. The goal is to provide thermal comfort and acceptable indoor air quality.

Acronym/Term	Description/Definition
JA	<p>Title 24, Part 6, Reference Appendix Joint Appendix (JA).</p> <p>Reference Appendices are adopted along with the Energy Code and contain data and other information that helps builders comply with the Energy Code requirements. There are three Reference Appendices: Residential Appendix, Nonresidential Appendix, and the Joint Appendix. While the first two appendices apply to residential and nonresidential construction respectively, JA applies to both.</p>
LBNL	<p>Lawrence Berkeley National Laboratory develops science and technology solutions for the world by bringing together multidisciplinary teams of researchers and creating tools for scientific discovery.</p>
OII	<p>Order instituting informational proceeding</p> <p>Initiates a public process, including hearings, workshops, and opportunities for participation by public notice.</p>
Raters	<p>Home Energy Rating System Raters.</p> <p>A rater is a technician certified by a HERS Provider to perform FV&DT services for newly constructed building and construction on existing buildings as an independent third-party.</p>
RDR	<p>Residential Data Registry.</p> <p>Data registry is a web service with a user interface and database maintained by a HERS Provider that complies with the applicable requirements in Appendix JA7, providing for registration of residential compliance documentation used for demonstrating compliance with Title 24, Part 6.</p>
RESNET	<p>Residential Energy Services Network.</p> <p>RESNET is a recognized national standards-making body for building energy efficiency rating and certification systems. RESNET standards are recognized by several federal government agencies (including the Internal Revenue Service, the U.S. Environmental Protection Agency, and U.S. Department of Energy), builders, contractors, and industry organizations.</p>

Acronym/Term	Description/Definition
PRC	<p>Public Resources Code.</p> <p>Codified in 1939 under the direction of the of the California Code Commission, the Public Resources Code consolidated and revised the law relating to natural resources, the conservation, utilization, and supervision thereof, along with mines and mining, oil and gas, and forestry.</p>
SB	<p>Senate Bill</p> <p>A proposed law, introduced during a session of the California State Senate for consideration by the Legislature, and identified numerically in order of presentation.</p>

Source: CEC staff

APPENDIX A: California Energy Commission Investigative Reports

Summary

Staff provides the following table (Table A-1) as a summary listing of the investigation reports created by CEC staff as a result of complaints or comments received. Table A-1 lists the investigation report and correlates it to the footnote within the staff report. This appendix includes the investigation reports in order list in Table A-1.

Table A-1: Investigation Reports Correlated to Footnotes

Title	Investigation Report Number	Parent Investigation Paper Number	Footnotes
Modesto Complaint	1-01	2021-006	35, 36, 54, 63
Hawthorne Complaint	1-02	2022-002	35, 36, 42, 54, 63
Provider QA	2-02	2021-1002	37, 67
HERS Annual Reporting	2-05	2022-1001	39, 44
2R vs 3R Compliance Data Differences	2-06		45

Source: CEC Staff

APPENDIX B: Proposed Regulations

The proposed regulations are provided in a separate document.

APPENDIX C:

Savings and Cost Analysis – Details

Summary

This appendix includes the staff assumptions used to estimate the costs and savings shown in Chapter 7 (Savings and Costs Analysis) of this staff report. These assumptions are made with the intent of providing a basis of cost impacts and potential cost benefits associated with the proposed regulations in Appendix B. The detailed savings and cost analysis includes four sections:

- ECC Rater Company
- Progressive Discipline
- Quality Assurance
- Training
- Provider - Rater Company Reporting.

Wage Assumptions

For this analysis, staff assumed the following wages for four different employment types.

Safety Consultant

[Safety Consultant Salary in California \(ZipRecruiter\)](#)

<https://www.ziprecruiter.com/Salaries/Safety-Consultant-Salary--in-California#:~:text=How%20much%20does%20a%20Safety,be%20approximately%20%2431.88%20an%20hour.>

Accessed on 4/28/23

As of Apr 21, 2023, the average annual pay for a Safety Consultant in California is \$66,310 a year; \$31.88 an hour; \$1,275 per week or \$5,525 per month

Administrative Assistant

[Administrative assistant salary in Sacramento, CA \(indeed.com\)](#)

[https://www.indeed.com/career/administrative-assistant/salaries/Sacramento--CA?&aceid=&kw=adwords_c_9099621460_0_0_pmax&sid=us_googconthajpmax-_c_g_9053056_gclid\\$_EAIaIQobChMIwbn2KbX_gIVpwKtBh0XkQSZEAAAYASAAEgLMifD_BwE&gclid=EAIaIQobChMIwbn2KbX_gIVpwKtBh0XkQSZEAAAYASAAEgLMifD_BwE&gclidsrc=aw.ds](https://www.indeed.com/career/administrative-assistant/salaries/Sacramento--CA?&aceid=&kw=adwords_c_9099621460_0_0_pmax&sid=us_googconthajpmax-_c_g_9053056_gclid$_EAIaIQobChMIwbn2KbX_gIVpwKtBh0XkQSZEAAAYASAAEgLMifD_BwE&gclid=EAIaIQobChMIwbn2KbX_gIVpwKtBh0XkQSZEAAAYASAAEgLMifD_BwE&gclidsrc=aw.ds)

Accessed on 4/28/23

\$20.26 per hour

Software Engineer

[Software Engineer Salary in California \(levels.fyi\)](#)

<https://www.levels.fyi/t/software-engineer/locations/california-usa>

Accessed on 8/18/23

80th Percentile

\$325,000 per year

\$155 per hour

Data Analyst

[Data analyst salary in California \(indeed.com\)](https://www.indeed.com/career/data-analyst/salaries/CA?&aceid=&kw=adwords_c_9099621460_0_0_pmax&sid=us_googconthajp_max-_c_g_9053056_gclid$_EAIaIQobChMIu96svKfX_gIV4hStBh0iXg7rEAAYASAAEgIUa_D_BwE&gclid=EAIaIQobChMIu96svKfX_gIV4hStBh0iXg7rEAAYASAAEgIUa_D_BwE&gclidsrc=aw.ds)

[https://www.indeed.com/career/data-](https://www.indeed.com/career/data-analyst/salaries/CA?&aceid=&kw=adwords_c_9099621460_0_0_pmax&sid=us_googconthajp_max-_c_g_9053056_gclid$_EAIaIQobChMIu96svKfX_gIV4hStBh0iXg7rEAAYASAAEgIUa_D_BwE&gclid=EAIaIQobChMIu96svKfX_gIV4hStBh0iXg7rEAAYASAAEgIUa_D_BwE&gclidsrc=aw.ds)

[analyst/salaries/CA?&aceid=&kw=adwords_c_9099621460_0_0_pmax&sid=us_googconthajp_max-](https://www.indeed.com/career/data-analyst/salaries/CA?&aceid=&kw=adwords_c_9099621460_0_0_pmax&sid=us_googconthajp_max-_c_g_9053056_gclid$_EAIaIQobChMIu96svKfX_gIV4hStBh0iXg7rEAAYASAAEgIUa_D_BwE&gclid=EAIaIQobChMIu96svKfX_gIV4hStBh0iXg7rEAAYASAAEgIUa_D_BwE&gclidsrc=aw.ds)

[_c_g_9053056_gclid\\$
_EAIaIQobChMIu96svKfX_gIV4hStBh0iXg7rEAAYASAAEgIUa_D_BwE&gclid=EAIaIQobChMIu96svKfX_gIV4hStBh0iXg7rEAAYASAAEgIUa_D_BwE&gclidsrc=aw.ds](https://www.indeed.com/career/data-analyst/salaries/CA?&aceid=&kw=adwords_c_9099621460_0_0_pmax&sid=us_googconthajp_max-_c_g_9053056_gclid$_EAIaIQobChMIu96svKfX_gIV4hStBh0iXg7rEAAYASAAEgIUa_D_BwE&gclid=EAIaIQobChMIu96svKfX_gIV4hStBh0iXg7rEAAYASAAEgIUa_D_BwE&gclidsrc=aw.ds)

Accessed on 5/2/2023

Annual Salary \$74,622

Monthly Salary \$5,283

Hourly Salary \$36.96

ECC Rater Company Savings and Costs Analysis Details

Rater companies will be required to be certified by a provider and complete initial rater company training on FV&DT program requirements, quality assurance, progressive discipline, and conflict of interest requirements. This initial training must not exceed eight hours. There is no expectation of significant training or other requirements for rater company certification. Therefore, the cost of this certification should be minimal. Staff estimates the cost of this training will approximately be \$90 per rater company based on similar industry training. Similarly, ongoing enforcement by providers of certification requirements should also be minimal, assumed to be no more frequent than on an annual basis. The proposed regulations include a requirement that one company principle be a certified rater. According to the websites of the existing providers, full rater certification costs either \$300 or \$2,500 (CHEERS and CalCERTS websites were accessed on May 9, 2023).

The rater company training (estimated to cost \$90) would be new training and as such, staff looked to other similar industry training as an example of possible costs. The actual cost of this training will be set by the providers when it is approved by the CEC. The providers may choose not to charge for this training or set whatever rate they deem reasonable. Staff estimates that the material for the rater company training are similar to the OSHA Construction Safety course offered by many training centers. The OSHA Construction Safety course is intended to provide entry-level construction workers information about their rights, employer responsibilities, and how to file a complaint as well as how to identify, abate, avoid

and prevent job related hazards on a construction site. One training center offers this course for \$90.⁹⁵

Progressive Discipline Savings and Costs Analysis Details

The savings and cost analysis for progressive discipline is separated into three sections, initial costs, ongoing costs, and costs associated with changes to the data registry. Based on staff estimates and input from Providers, the initial costs to the provider to set up the required internal procedures compliant with the proposed progressive discipline requirements should be no more than \$17,000 and take no more than three months to create. The on-going costs associated with the corrective actions that may be taken by the provider should be approximately \$21,000 annually assuming a rater (or rater company) audit failure rate of no more than 10 percent. The initial costs associated with the required programming changes to the provider data registry should be approximately \$25,000 and take no more than 160 hours to complete. While there may be costs to the raters or rater companies, those costs are not implemented by the proposed regulations and are completely under the control of the providers and are therefore considered speculative.

Initial Costs

The initial costs include development of the provider internal procedures compliant with the proposed progressive discipline requirements. Staff estimates that this will require three months of a highly trained professional with intimate knowledge of the workings of the provider and rater industry as well as the construction industry in general. While it is not possible to ascertain the salary of such a person, staff makes the assumption that it is roughly equivalent to that of a Safety Consultant operating in California. Assuming three months' work at \$5,525 per month and rounding to two significant digits, staff estimates that the initial costs to develop the provider internal procedures compliant with the proposed progressive discipline requirements would be approximately \$17,000.

On-going Costs

The on-going costs related to the proposed progressive discipline regulations consist primarily of retraining raters or rater companies found to be in violation of the proposed regulations. These violations will most commonly be associated with quality assurance failures. Therefore, the staff assumptions are that there will be a consistent cost for retraining and a consistent number of failures per quality assurance audit.

Based on the public disclosures of CalCERTS and CHEERS, staff determined that there are approximately 900 HERS raters currently certified (taking into account those raters that are certified by both providers). Since there are two providers (CalCERTS and CHEERS) staff divided this value in half (450 raters) to represent an average number of raters per provider. The proposed quality assurance regulations would require four audit per rater per year (approximately 1,800 audits). Based on the comments submitted by CHEERS (Docket 22-

95 [OSHA Outreach \(10 & 30 Hour\) Online Training Sale | Safety Unlimited](https://www.safetyunlimited.com/1030-sale.asp?gclid=EAIaIQobChMI0feBzITf_gIVPyitBh2UcAdREAAAYiAAEgLTbPD_BwE), https://www.safetyunlimited.com/1030-sale.asp?gclid=EAIaIQobChMI0feBzITf_gIVPyitBh2UcAdREAAAYiAAEgLTbPD_BwE, Accessed on May 5, 2023.

HERS-02, TN# 248136), approximately 10% of these audits should be expected to result in an audit failure (180).

For each audit failure, staff assumes that the provider will require that the rater be retrained on the specific FV&DT procedure for which they were failed. Staff estimates that each retraining will take no more than two hours and will include instruction and testing from a qualified instructor employed by the provider. For simplification and consistency, the cost for this qualified instructor is best represented by the salary of a Safety Consultant employed in California (\$31.88 per hour). Additionally, staff assumes that each retraining will require the services of an administrative assistant to complete the necessary tracking requirements internal to the provider (30 minutes at \$20.26 per hour). This is approximately \$74 per retraining in personnel costs.

Staff assumes that the operation costs of the training facilities would be comparable to a warehouse (\$8.22 annually per square foot).⁹⁶ Staff assumes that the training facilities would be approximately 20,000 square feet and that the retraining would be charged for the facility for the two hours of the retraining. This equates to approximately \$40 per retraining.

With these assumptions, staff estimates that the total annual cost for retraining would be approximately \$21,000.

Data Registry

The changes to the data registry for the proposed progressive discipline regulations would be to potentially restrict access of the data registry for a rater or rater company. This may occur if the provider deemed it necessary to motivate compliance from a rater or rater company. Staff has seen similar restrictions put in place relatively quickly by providers and assumes that these features can be incorporated in less than 160 hours of programming. Assuming a programmer salary of \$155 per hour, this equates to a one-time cost of approximately \$25,000.

Quality Assurance Savings and Cost Analysis Detail

The existing quality assurance requirements assume an audit rate of 1 percent of the certificates of verification registered by each rater and 1 percent of the total number of certificated registered overall. The proposed quality assurance regulations would require that each rater be audited four times per year. The proposed regulations would also require that every seventh sample group be audited. Therefore, staff compared the on-going costs of the existing quality assurance requirements to the proposed. Additionally, staff estimated the initial costs for setting up the provider-internal processes to support the proposed quality assurance requirements.

Staff estimates the initial cost to the provider to set up the new internal procedures and quality assurance database compliant with the proposed quality assurance requirements to be approximately \$11,000 and should take no more than two months to complete. Staff estimates the on-going quality assurance costs to result in an annual savings of approximately \$500,000

⁹⁶ Warehousing and Fulfillment, [Warehousing Services Costs, Pricing, Rates and Fees \(warehousingandfulfillment.com\)](https://www.warehousingandfulfillment.com/resources/warehousing-services-costs-pricing-rates-and-fees/), <https://www.warehousingandfulfillment.com/resources/warehousing-services-costs-pricing-rates-and-fees/>. Accessed May 2, 2023

to the provider when compared to the existing annual costs of quality assurance compliance required by the existing HERS regulations. While there may be costs associated with the quality assurance procedures for raters or rater companies, these costs are completely within the control of the provider and are not specified in the proposed requirements.

Initial Costs

There are two components to the initial cost considered by staff, the provider internal procedures and the quality assurance database. Staff estimates that each of these components will require one month to complete and will require the efforts of a highly trained professional with intimate knowledge of the workings of the provider and rater industry as well as the construction industry in general (salary to be represented by a Safety Consultant operating in California, \$5,525 per month). Therefore, staff estimates the initial costs to be approximately \$11,000.

Ongoing Costs

Staff has access to several years' worth of data from both CalCERTS and CHEERS regarding their individual data registry activities. However, this data is considered confidential. Therefore, staff has made efforts to obfuscate this data so as not to reveal confidential information. These values will be marked in this analysis as obfuscated confidential data (OCD).

The cost to perform the audits under the existing regulations is assumed to be approximately half the cost of a home inspection in California (\$260).⁹⁷ This value compares reasonably well with confidential information from the Providers.

Estimate of Existing Quality Assurance Costs

To be conservative, staff assumes that the provider operating under the existing regulations will perform an audit of at least 2 percent of the registered certificates of verification. On an annual average this is approximately 5,700 audits per year (this value is based on OCD). Assuming a cost of \$260 per audit, the existing quality assurance requirements should cost a provider at least \$1,490,000 per year.

Estimate of Proposed Quality Assurance Costs

Staff estimates that the four required audits for each rater per year will total to be 1,800 audits annually. Additionally, the proposed quality assurance requirements include approximately 2,000 audits for sample groups registered by raters. Assuming an audit cost of \$260 per audit, staff estimates that the proposed quality assurance program will cost approximately \$990,000 annually.

This represents an overall annual savings of \$500,000 for each provider.

Training Savings and Cost Analysis Detail

⁹⁷ How Much Does a Home Inspection Cost in California? (houzeo.com), <https://www.houzeo.com/blog/how-much-does-a-home-inspection-cost-california/>. Accessed 9/27/23.

Rater Training Estimated Costs

Training materials are redeveloped by existing providers for each new code cycle. This process varies depending on the of the complexity of the new code requirements. However, in general this process takes approximately six months to complete, and it is typically well informed by the prior code cycle materials. The proposed training requirements will include some new training subjects. Staff estimates that the initial (and one time) cost for the new training requirements will be approximately \$11,000 and take no more than two additional months to complete when compared to the current training development process. While there may be costs to the raters or rater companies, those costs are not mandated by the proposed regulations and are completely under the control of the providers.

Staff estimates that the current training curricula requires approximately six months to prepare by a highly trained professional with intimate knowledge of the workings of the provider and rater industry as well as the construction industry in general (salary to be represented by a Safety Consultant operating in California, \$5,525 per month). This totals to be approximately \$33,000. Staff estimates that the proposed additional training requirements will take an additional two months to complete but will greatly inform subsequent code cycles. Staff estimates that this will represent an initial cost of \$11,000.

Rater Company Training Estimated Costs

The proposed regulations include training for Rater Companies regarding the overall FV&DT process, parties, and their responsibilities. This training is restricted to no more than eight (8) hours but is far more likely to be accomplished in 30 minutes. Both existing providers use a learning management system (LMS) to disseminate training and, to a certain extent, testing. Creating a new training program from scratch is a significant endeavor, although an LMS is not a requirement of the proposed regulations. Additionally, there is an ongoing cost regarding the administrative support for a new training program which is estimated to be approximately 15% of the initial costs.

Staff assumes that the development cost will approximately \$10,000 per hour⁹⁸ of instruction plus 10 hours of oversight from the subject matter experts (\$155 per hour). Therefore, the range of one time development costs for a training program between 30 minutes to 8 hours in length will be between \$7,000 and \$82,000. The ongoing administrative costs will be between \$750 and \$12,000 annually.

Provider-Rater Company Reporting Savings and Cost Analysis Detail

The proposed annual reporting on regarding rater company and independent rater activities is submitted to the CEC through the providers. Each provider is to gather the required information from each certified rater company and independent rater. Staff estimates that the initial and on-going costs associated with the annual rater company reporting requirements

98 [How Much Does it Cost to Develop an Online Course in 2023? | SkildLabs](https://skildlabs.com/how-much-does-it-cost-to-develop-an-online-course-in-2023/), <https://skildlabs.com/how-much-does-it-cost-to-develop-an-online-course-in-2021/>. Accessed 9/27/23.

will be approximately \$2,200 for each rater company or independent rater and an additional \$5,300 for each provider.

The annual reports will include the following elements (beginning in 2027):

- Data submitted to the provider by all certified rater companies or independent raters.
- For each rater company or independent rater:
 - compliance status of the principal licensure requirements.
 - number of all types of certificate status for all raters employed by each rater company.
 - indication of whether the total number of FV&DTs registered by each rater company and independent rater is accurate as compared to the provider data registry.
- An aggregation of the total and average costs of services for each type of FV&DT reported by all rater companies and independent raters without any associated identification. Cost of services is to be aggregated for each type of FV&DT and summarize by local jurisdiction and climate zone independently.

This cost will impact both the provider and the rater companies (and independent raters). Staff estimates that the rater companies and independent raters will require approximately 60 hours to gather and report (to the provider) all the required information. Staff assumes that a data analyst will perform this work (\$36.96 per hour). This is a total estimated annual cost of approximately \$2,200 for each rater company or independent rater. To coordinate the submission of this information and create and submit the required reporting to the CEC, the provider will also use a data analyst (\$5,283 per month). Staff estimates that the provider data analyst will need approximately one month to complete all tasks. This is a total estimated annual cost of approximately \$5,300 for the provider.