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Earth Advantage 23-HERS-02 Workshop #1 Comments

Additional submitted attachment is included below.

MAY 24, 2024
RE: Whole-House Home Energy Rating and Labeling Pre-Rulemaking
Docket No. 23-HERS-02

California Energy Commission (CEC) Docket Unit
Docket No. 23-HERS-02
715 P Street
Sacramento, CA 95814

Establishing a California Home Energy Labeling Program That Accelerates Equitable Housing Decarbonization

Dear Commissioner McAllister and CEC Staff,

Earth Advantage thanks the California Energy Commission for their interest in the important topic of home energy labeling in California. Earth Advantage is a national nonprofit based in Portland, Oregon with extensive expertise on the costs, benefits, risks, and rewards associated with home energy labeling programs, and is eager to support California with this expertise in this RFI response.

Earth Advantage's staff bring a combined 70+ years of experience designing, implementing, and evaluating impacts of home energy labeling policies and programs. Earth Advantage is a recognized leader on this topic both within California – as an implementer in the Bay Area Regional Energy Network (BayREN)'s Home Energy Score Rebate Program – and nationally: Earth Advantage has supported dozens of cities, states, financiers, and underwriters around the country explore home energy label programs and policies, and has been recognized by the U.S. Department of Energy (US DOE)'s Home Energy Score program for national leadership, innovation, and home energy labeling results.

Home energy labels that can be used in real estate listings, home appraisal, financing determinations, and public policy have the power to transform the market at scale. A successful home energy label will provide useful and easy to understand information to key housing decision makers in moments when they are able to take action to invest in home energy upgrades that improve home comfort, reduce energy bills, improve indoor and outdoor air quality, and support climate and housing goals. Home energy labels should provide the people in a market with a common lexicon for energy performance of

homes, but also be designed to meet the needs of various housing decision makers – homeowners, buyers, sellers, renters, home appraisers, mortgage lenders, and housing/infrastructure regulators – such that these people can feel confident investing in home efficiency and electrification features.

Earth Advantage also believes that this work will only be successful at the necessary scale to impact the climate crisis if national standards and systems are adopted. Nationally applicable standards and systems will make it easier for national financing, underwriting, regulating, and policymaking entities to aggregate data and make changes to their "business-as-usual" practices that carry national ripple effects. As the state with the largest population, the greatest number of homes, and highest GDP, California can create a pull for these national players to participate in green home funding and financing in California as well as the rest of the country. California is uniquely poised to update its whole-house home energy labeling program to drive energy upgrades in California's 14 million homes, as well as the 126 million homes in the US outside of California.

If successful, green home lending in the US could begin to look more like Europe, where Energy Performance Certificates (EPCs) are supporting financial markets as the European Banking Authority has begun requiring lenders to report their Green Asset Ratio (GAR) starting in 2024. For GAR reporting, EPCs enable real estate to be "taxonomy eligible assets," meaning they can be measured as an element in this ratio and monitored. The DOE's Home Energy Score was designed to meet needs for documenting home energy status in the United States and improves upon label elements gathered from researching impacts of EPCs in Europe. By adopting a home energy labeling scheme in California that builds off existing systems that can drive national markets while also meeting state-specific needs, CEC can drive outsized impact with this rulemaking. More information about how home energy labels can unlock financing is available in this report Earth Advantage co-authored with RMI: https://rmi.org/insight/build-back-better-homes/

For CEC to establish a California Home Energy Labeling program that accelerates equitable housing decarbonization across the state, Earth Advantage provides the following high-level recommendations:

1. **Launch a home energy label that is useful and actionable for existing California homes.** According to the US Census, there were over 14.6 million housing units in California in 2022, and nearly 120,000 housing units authorized by building permits statewide that same year. Getting new housing right from a climate and equity perspective is vital, if for no other reason than to prevent the

need for home energy upgrades shortly after construction is completed, and Earth Advantage applauds the efforts CEC has undertaken to support climate-friendly new homes across the state. However, meaningful reduction of carbon emissions and energy costs is only possible through programs that also spur market demand for home energy upgrades in the 99% of California housing that is pre-existing. Many homeowners, buyers, and renters in existing homes lack needed information about how homes differ in terms of expected energy costs and how home energy performance can be improved in existing homes.

2. **Include DOE's Home Energy Score as a component within a California Home Energy Label.** Earth Advantage strongly recommends use of Home Energy Score as a component of any home energy label issued in California, given its applicability to national market transformation efforts, design to be used across comparable homes, and current use in the CPUC-funded BayREN Home Energy Score program. Home energy labels built off DOE's Home Energy Score can meet the Inflation Reduction Act (IRA) Home Efficiency Rebates requirement for a third-party verification. Rather than starting any label design or modeling engine from scratch, CEC can leverage DOE and BayREN investments in these areas to provide home energy labels that are nationally applicable and deliver California-specific information about electrification, demand flexibility, and decarbonization.

3. **Support CEC-approved home energy labels as a requirement for California home sale listings.** Currently, most homeowners, buyers, and renters have insufficient information about how their home uses energy and what factors contribute to poor energy performance, high energy costs, and high carbon emissions. A home energy labeling requirement would help educate consumers about these issues, help them protect themselves from high energy bills, and send more homeowners on a pathway toward decarbonization. Home energy labels can act as a roadmap for consumers that may not otherwise consider home energy upgrades and can serve as a mechanism to reduce customer acquisition costs for businesses and programs seeking to deploy these upgrades and government funds. A study from Lawrence Berkeley National Laboratory (LBNL 2022) found that when homes were required to disclose scores, for each one-point increase in a home's Home Energy Score was associated with a 0.5% increase in sales price and 5.5% reduction in odds of 30-day mortgage delinquency. In those same markets, separate analyses have shown that disclosure has led to higher rates of

energy improvement investment by buyers and sellers. Home energy labels also foster availability of financing for home energy upgrades, particularly through mortgage financing products where borrowers can complete upgrades based on a home's as-completed predicted value. Earth Advantage recommends CEC align this rulemaking with BayREN's Home Energy Score Rebate program, which CPUC has put on track for a pilot statewide Home Energy Score California program.

4. **Support CEC-approved home energy labels as a requirement for California rental home listings.** An energy disclosure rating system on all rental units would empower renters to understand the cost of utilities when deciding where to live. This would incentivize landlords to take advantage of energy efficiency and electrification programs and rebates to appear more attractive to prospective tenants, thus mitigating some influence of the split-incentive between landlords and renters on energy upgrade investments. In cases where tenants are income-qualified for EBD, these labels can serve as an impetus for landlords to pursue government funding to support rental property upgrades.

Home energy labeling fits into a larger theory about driving growth of the clean energy economy through market transformation. Market transformation is a long and continuous process with changes that can be observed through market indicators. In the ACCEE paper U.S. and International Experience with Market Transformation where home energy labeling is called out as a strategy, it is described as "At its core, market transformation is about increasing customer demand for cost-effective,energy-efficient products and services." Market transformation efforts must recognize there is no one "market decider" that has direct control over the array of decisions that result in expanded market share of clean energy services. Instead, the culminating outcome of market transformation activities must appeal to the interests and needs of market actors - including homeowners, buyers, renters, lenders, and regulators - to justify their investment of time, money, and political capital.

Public Comment Specifically Regarding the Presentations and Discussions from the Public Workshop on April 30, 2024

Comments Regarding the Use of Labels and Certifications in Voluntary and Mandatory Policies

Earth Advantage wants to acknowledge that the opening public webinar served as a way to showcase the ends of the spectrum for use of home energy labels outside of California, which may be useful to inform CEC's work. Earth Advantage wants to make sure there is clarity about the various roles that green certifications versus energy labels, as well as disclosure policies versus voluntary programs, do and don't have in the marketplace. Given potential for confusion among public audiences, Earth Advantage offers the following reminders:

- ***CEC Can Establish a Standard California Home Energy Label That Does Not Crowd Green Certifications Out of the Market.*** Importantly, home energy labels serve different roles in the marketplace to green certifications, and these roles should not be conflated. Green certifications are designed to showcase homes that have achieved certain minimum thresholds of features or performance, and broadly cannot be used in a mandatory disclosure policy as many homes would not be able to qualify for certification. By contrast, home energy labels are designed to serve as a "miles-per-gallon" style rating or "nutrition facts" label, but for housing. It provides information in a standard way to the marketplace, which they can then use to inform decisions and value. In the same way that mandating disclosure of nutrition facts on food products does not crowd out other food labels - e.g. Certified Organic, Non-GMO, or Free Range - a home energy label does not crowd out green certifications from the market[1]. In fact, consumer research even suggests the opposite: when consumers have access to comparable information across homes, the information from green certifications becomes even more valuable, not less (see ACEEE 2020 and ACEEE 2022).

- ***CEC's Rulemaking Should Build Off Existing Efforts in California.*** Earth Advantage urges CEC to consider the programs that are already serving the California marketplace, including home energy labels that have been adopted by local governments for mandatory and voluntary disclosure. In particular, the Bay Area Regional Energy Network (BayREN)'s Home Energy Score program has launched a program that has served Bay Area homes for close to a decade and provides a comprehensive home energy label that focuses on pathways to improve envelope

[1] Similarly for cars, the presence of an "MPG" rating still allows for cars to be marketed as hybrid, plug-in hybrid, all electric, and more. MPG can serve as a component of an overall understanding of green vehicles without crowding out other context about cars.

efficiency and electrify the home. A sample BayREN Home Energy Score label is included in **Appendix A**.

- ***CEC Should Establish a Label System That is Well-Positioned to Be Included in Local Government Disclosure Policies.*** Generally, Earth Advantage has been working with many local governments across California to explore opportunities for both mandatory and voluntary home energy labeling disclosure. These local governments would benefit from CEC standards that inform the systems they can adopt. In particular, Earth Advantage believes low resourced local governments would benefit as they may lack the staff capacity to explore label design options themselves. Earth Advantage recognizes the role that state-level definitions of home energy labeling has provided in Oregon to support local government disclosure policies. The systems set by the Oregon Department of Energy are available online as well as included in **Appendix B**.

Comments Regarding Collaborations with Real Estate

- ***CEC Should Recognize Perspectives of Real Estate Agents Working in Regions with Home Energy Score Disclosure Policies.*** Earth Advantage has completed extensive work with real estate agents throughout the country, and particularly in Oregon where there are existing Home Energy Score disclosure policies. Numerous resources are now available uncovering the data and myths of how these policies impact real estate agents.
    - After launching the Home Energy Scoring program, the City of Portland produced a brochure of Stories From The Field featuring experiences of various real estate professionals and homeowners. Interviews with real estate agents and brokers have found that many see this as an opportunity to grow their businesses and appeal to new homebuyers that care about affordability and environmental impact. Real estate agents have reported that the Score is easy to understand and easy to explain to clients, and can help buyers both find homes that have hidden efficiency features and prioritize upgrades based on the report recommendations.
    - According to the City of Portland 30-Month Report on their Home Energy Score Program, many of the fears real estate agents had about negative program impacts did not bear out. The report's first key finding states, "Despite initial concerns from the real-estate community that Home Energy

Score could stall real estate sales transactions, the policy requirements have caused little to no disruption in the market." The city found that Home Energy Score Assessors were readily available to fill the need at a relatively inexpensive rate (at time of reporting, $125 on average). The city also made Home Energy Score assessments free to households with incomes at or below 60% area median income (AMI), which helps to ensure cost is not a barrier to Home Energy Score access. The report also found via a homeowner survey that the majority of homebuyers talked to their real estate agent about Home Energy Score and ranked the recommendations section of the report as the most useful.

- Increasingly, review of real estate listings in Portland shows that real estate agents are choosing to prominently highlight home energy features even beyond the Home Energy Score disclosure ordinance requirements. As real estate agents better understand energy features and recognize the value of promoting these features to prospective buyers, the market is transformed as buyers have better access to this information and appraisers can justify appraisal adjustments. Links in the table below show current real estate listings in Portland with Home Energy Score information included in the home summary section.

Real Estate Listing	Score	Home Description Quotes
8533 N Curtis Ave	10	"This 2012 Earth Advantage Gold construction home is the perfect mix of thoughtful design and meticulous maintenance" "But the real showstopper (maybe it was the yard, maybe the vaulted primary, or the high ceiling main floor)? No, it has to be the home's eco-friendly credentials. Outfitted with solar panels to offset electricity costs, this property is more than just a cozy nest - it's a cost-effective and planet-loving choice. And the Earth Advantage Gold construction adds to the green qualifications and more importantly, provides cost savings and comfort for you."
5402 NE Hoyt St	2	"new windows, new mechanical systems"
5927 NE Alameda St	4	"Central AC, Gas FP, fenced backyard w/patio, detached garage"

6205 N Boston Ave	9	"New electrical panel, switches and fixtures. All new plumbing, fixtures, new hot water heater, silent fans in bathrooms"
2620 SE 61st Ave	5	"Solid system upgrades throughout, including newer furnace (2009) with upgraded filter box and UV light for air quality, brand new ducting, new electrical and plumbing, and a new roof in 2023 with transferable warranty"
4016 NE 68th Ave	7	"Upgrades include new windows & exterior doors, furnace, A/C, electricals, & radon system"

- ***CEC Should Review the Academic Research Showing Impacts of Home Energy Labels in Real Estate Markets.*** Beyond anecdotal evidence from real estate professionals, there is a growing body of research showing that Home Energy Score drives real impact in the real estate market in terms of consumer understanding, greater consumer demand and valuation. An important consideration is that some of these market transformations occur regardless of the impressions of individual real estate agents; for example, having a Home Energy Score in real estate listings not only enables buyers to filter housing options by energy performance, it also helps appraisers to attribute value to improvements through analysis of comparable properties, which is not a possible pathway when the vast majority of homes don't have home energy labels. Even if a cost approach to appraisal valuation could also attribute home value, it is less likely to occur as the comps approach to appraisal valuation is far more commonly used by appraisers. Home Energy Score can also be used in automated valuation models (AVMs), which are used by the financial industry to assess accuracy of home appraisals. Appraisers are incentivized to not conduct any adjustments on home value that may get their work flagged by AVMs as potentially inaccurate. Therefore datasets that can be made available to both professional appraisers and AVMs for quantification can better assure wide scale adoption of home energy information in real estate valuation.

  Academic studies with statistically significant findings that CEC should consider in their understanding of real estate impacts, with abstract / key takeaway information quoted:

- LBNL review of how Home Energy Score affects home value (2022): "Using a sample of 26,291 home sales that occurred after HES assessments, we found that a one-point increase in HES in these locations was associated with a 0.5% increase in sale price, and an increase in $100 of estimated annual energy bills was associated with a 0.4% decrease. This magnitude of effect is consistent with estimated magnitudes of home sale premiums for other green or energy-efficient home certifications in the literature. We also found that a one-point increase in HES was associated with a 5.5% reduction in the odds of a loan going 30 days delinquent if the loan originated after the assessment occurred. Similarly, we found that a $100 decrease in estimated annual energy bills was associated with a 2.3% decrease in the odds of a loan going delinquent if it originated after the assessment occurred. Our results suggest that HES provides a valuable signal for housing market transactions in specific situations."
- Valuation of home energy information in real estate listings (2020): "Key Takeaways: Energy efficiency information encouraged home buyers to avoid the least efficient homes and choose more efficient homes in a simplified simulation of a real estate website. Presenting efficiency information for only the most efficient homes did not encourage home buyers to choose more efficient homes in our simulation. This suggests that a voluntary labeling policy might be less effective than a mandatory labeling policy in which all home listings must include energy efficiency information. Energy efficiency information was most valued (in terms of willingness to pay) by relatively wealthy and educated home buyers who planned to spend the most to buy their next homes. Home buyers valued efficiency most when it was presented as an image depicting the home's efficiency score along a continuum (a line) from inefficient to efficient."
- Valuation of home energy information in rental property listings (2022): "Key Takeaways: Home buyers valued efficiency most when it was presented as an image depicting the home's efficiency score along a continuum (a line) from inefficient to efficient. Home buyers valued efficiency most when it was presented as an image depicting the home's efficiency score along a continuum (a line) from inefficient to efficient. Home buyers valued efficiency most when it was presented as an image depicting the home's efficiency score along a continuum (a line) from inefficient to efficient."

- Mandatory Energy Efficiency Disclosure in Housing Markets (2022): "Using similar nearby homes as a comparison group, we find that this requirement increases price premiums for energy efficiency and encourages energy-saving investments. We additionally present evidence highlighting the market failure—incomplete information by both buyers and sellers—that prevents widespread voluntary disclosure of energy efficiency in housing transactions. Our findings support that disclosure policies can improve market outcomes in settings with symmetrically incomplete information."

Comments Regarding the Use of the Danish Program to Inform California's Rulemaking

- ***CEC Should Recognize Key Elements of Denmark's Programmatic Success.*** Earth Advantage was happy to see representation from the Danish Consulate talking about the success of the Danish labeling program. We believe that the US following a pathway similar to Europe's use of the Energy Performance Certificates will be beneficial to market transformation in the United States. In addition to the points made by the Danish Consulate, Earth Advantage believes three major factors contribute to the success of the Danish program:
    - ***Mandate at Time of Listing.*** As Denmark showed in their program slides, many Danish homes receive ratings of C or below. If sellers had a choice about whether or not to share this information with prospective buyers, many of these households would not have energy information included. By becoming a standard fixture of data buyers expect to have in the marketplace for the last 20 years, buyers have come to expect the home to have an energy rating, and may be concerned about a property if no information is provided. Earth Advantage has seen similar results from conversation with first-time home buyers in Oregon who have expressed surprise when they learn that Home Energy Score disclosure is not a requirement across the entire U.S. The decision to mandate disclosure at the EU level has greatly supported consumer understanding of this information and has created an important incentive for sellers to comply with the law.
    - ***Adoption of the EU's EPC System.*** Importantly, Denmark did not create an EPC system that was very different from that of the European Union. Across the EU, EPCs are included in home property listings, which has added to

programmatic scale and more widespread consumer knowledge. The ability to understand EPCs across EU member states also means that mortgage financiers are more readily able to include this information in mortgage lending decisions.

- ***CEC Should Be Cautious of Using an "A through F" Rating System.*** Earth Advantage urges CEC to consider the ways that the EPC system in Europe may not be readily adoptable in the context of a US real estate market and populace. Overall, Earth Advantage strongly recommends that if CEC considers creating a new home energy label design with metrics for energy information that have previously been untested in the US, that CEC invest in focus-group research and A/B message testing to understand how typical California residents may react to the information. Earth Advantage also urges that such research activities focus on interpretations of low-income and marginalized communities. For a few reasons, Earth Advantage provides particular caution around the potential use of an "A through G" metric on CEC's home energy label:
    - ***Grade Inflation in the US Compared to Europe.*** European and US students have different cultural understandings of academic grades, including "A through F". About 50% of students in the US receive an "A" in academic settings, while in Europe about 10% of students receive an "A". There are articles discussing the trend of academic grade inflation in the US compared to other countries, including Denmark specifically. Comparing these scales finds that a grade of "D" in Denmark translates to an equivalent of "B-" in the US, while a grade of "D" in the US connotes "inadequate" and failure. There are many contributing reasons for these cultural differences, including culturally a US emphasis on personal achievement versus in the EU an emphasis on educational equity. It is far more common for EU residents to receive a "C" grade than it is in the US, and there is different cultural weighting of what these grades mean about the quality of a product and the person as an individual.
    - ***US History of Letter Grading Housing for Redlining.*** Outside of academia, the US in particular has a particularly fraught history with using letter grades on housing that is unique when compared to context in Europe. The practice of redlining US neighborhoods was based on a government agency's system for assigning letter grades to households and neighborhoods: neighborhoods

deemed best were given “A” grades and colored green on maps, while neighborhoods deemed “hazardous” for financial investment were given a grade of “D” and colored red - hence the name, redlining. The repercussions of this racist system are still in action today, as many residents of formerly redlined neighborhoods experience poorer health outcomes, suppressed housing values, and persistent economic inequality. For many people, including those alive today in California, the government issuing “A through F” ratings of housing -- albeit for different purposes and with different goals in mind -- may serve as painful reminders of this practice still negatively impacting them today. In particular, homes that have suffered from lacking investment due in part to redlining are likely to be homes that continue to suffer from poor energy efficiency resources. CEC should thoughtfully consider how, even if not the intention of a current effort, a letter grading system could be interpreted by California residents, real estate, and lenders. Images of redlining maps in California are included in **Appendix C.**

- ***Letter Grades are Emotional and Feel Personal.*** In part driven by the US use of letter grades to assign value of work completed in academia as well as determining mortgage lending risk, receiving a letter grade is a highly emotional experience. Many people interpret a below-average or failing letter grade as a personal indictment, and it may convey a sense of failure or mistakes. Importantly, Earth Advantage does not believe that the presence of unequal access to energy efficient and clean energy features in US housing is a failure to be blamed on current housing residents. Home energy upgrades have been systematically inaccessible to homeowners and residents, a situation which has more extremely impacted lower income households and black and brown households. Importantly, the goal of redlining was to disincentivize financial investment in certain neighborhoods as risky; the intention of home energy labeling is to have the opposite effect: to pull in funding and financing to support home energy upgrades that better serve households. CEC should carefully consider how any metric utilized in a home energy labeling program will inspire funding and financing to support housing without turning off homeowners and residents.
- ***Real Estate Has Historically Hindered Programs by Spreading Fear of “A through F” Ratings.*** In part driven by different cultural understandings of “A through F” ratings, in the US real estate groups have expressed concern

about labels that use this metric. In fact, when Massachusetts attempted to establish a home energy labeling policy across the state, real estate groups publicized media suggesting the system would be bad for consumers because it was an "A through F" system - even though that was not actually a component of the proposed system in Massachusetts. Opposition from groups that recognize fear of an "A through F" rating system have successfully mobilized action in the past that has prevented home energy labeling systems from being systematically adopted. CEC should carefully consider how a program taking this approach in the US could struggle to achieve widespread acceptance in California and potentially hinder progress in other regions.

Driven by these issues and informed through focus groups and message testing, DOE chose a 1-through-10 metric for Home Energy Score. DOE's intention has been to design a program that will successfully pull in funding and financing for home energy upgrades by acknowledging gaps in the market without assigning blame to current homeowners and residents.

- ***CEC Should Consider Other Elements of Programmatic Differences Between California and Denmark.*** In addition to the differences described above, there are other differences between the US and Denmark CEC may consider:
    - ***Denmark Requires EPCs to be Generated by Licensed Architects or Engineers.*** This is a significantly higher educational requirement for energy label generation than any current program in the US, and likely contributes to the higher cost of receiving home energy labels in Denmark as opposed to current programs in the US.
    - ***Danish and US Homeowners May Present Differing Rates of Compliance in Mandated Programs.*** Denmark is well known for its culture of rule following, including a resistance to jaywalking and general desire to follow societal rules. Programs in Denmark may expect different levels of compliance attributable to cultural differences than programs in the US.

Please reach out if you have any questions about these comments.

Sincerely,

Madeline Salzman
Head of Strategic Partnerships
Earth Advantage

Appendix A. Sample BayREN Home Energy Score Report

Home Energy Score
Energy Savings Pathway Report

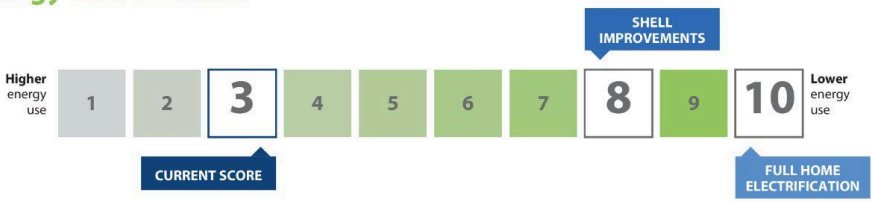
BAYREN

U.S. DEPARTMENT OF ENERGY
Home Energy Score™

LOCATION: 846 San Luis Rd, Berkeley, CA, 94707
BEDROOMS: 3 **HEATED FLOOR AREA:** 3,169 sq.ft.
COMPANY: JMC Building Inspections
EMAIL: lee@jmcinspections.com
YEAR BUILT: 1925
ASSESSMENT DATE: 05/08/2024
ASSESSOR: Lee Parsons
PHONE: (510) 525-7173

Current Score	Recommended Shell Improvements[1]	Full Home Electrification[2]
3	8	10
OUT OF 10	OUT OF 10	OUT OF 10
Estimate of Current Yearly Energy Costs[3]	Estimate of Energy Costs with Shell Improvements	Estimate of Energy Costs with Electrification
$4,091	$3,450	$3,488

Home Energy Score Details



Official Assessment: ID# 518510

Average U.S. Home's Score = 5

The U.S. Department of Energy's Home Energy Score assesses the energy efficiency of a home based on its structure and heating, cooling and hot water systems. Learn more at HomeEnergyScore.gov.

Current Estimated Energy Use By Fuel Type[3]

Fuel Type	Estimated Current Use	After Shell Improvements	After Full Electrification
Electric: 9,118 kWh/yr ($0.31/kWh)	$2,825	$2,775	$3,488
Natural Gas: 534 therms/yr ($2.37/therm)	$1,266	$675	$0
Other:	$0	$0	$0
Renewable Generation: ($0.31/kWh)	N/A	N/A	N/A
TOTAL ESTIMATED YEARLY ENERGY COSTS	$4,091	$3,450	$3,488

This Home's Carbon Footprint[4]

Carbon footprint by fuel type (measured in Metric tons of CO2): Electric: 0.4 Natural Gas: 2.8

Learn how to improve this score and electrify your home to use less energy on the next page.

earthadvantage.

Tackle energy waste today!

- [x] Get your home energy assessment. Done!
- [ ] Choose energy improvements from the list of recommendations below.
- [ ] Select a contractor (or two, for comparison) and obtain bids.
- [ ] Perform upgrades and enjoy a more comfortable and energy efficient home.

Current Score
3
OUT OF 10

For More Information Visit the Websites Below

BayREN Homeowner Info	State Information	US Rebates & Tax Credits	Incentive Information
SCAN ME	SCAN ME	SCAN ME	SCAN ME
bayren.org/homeowners	energy.ca.gov	energy.gov/save	incentives.switchison.org

Energy Improvements Customized for Your Home

SHELL IMPROVEMENTS[1]

FEATURE	TODAY'S CONDITION	RECOMMENDED IMPROVEMENTS
Envelope/Air sealing	Not professionally air sealed	Professionally air seal
Attic insulation	Ceiling insulated to R-21	No recommendation
Duct insulation	Insulated	No recommendation
Duct sealing	Sealed	No recommendation
Wall insulation	Insulated to R-0	Insulate to R-13 or higher
Floor insulation	Insulated to R-0	Insulate to R-30 or fill floor cavity
Cathedral Ceiling/Roof	Roof insulated to R-0	Insulate R-30 or maximum possible
Windows	Multiple types	Upgrade to double-pane or other high-efficiency windows

FULL HOME ELECTRIFICATION IMPROVEMENTS[2]

FEATURE	TODAY'S CONDITION	RECOMMENDED IMPROVEMENTS
Appliances: Heat Pump Dryer	Electric Dryer	No recommendation
Appliances: Induction Cooking	Electric Range / Electric Cooktop	No recommendation
Electrical Panel	200Amps	No recommendation
Air Conditioner	None installed	Upgrade to Electric Heat Pump, minimum 15 SEER
Air Conditioner 12%	None installed	Upgrade to Electric Heat Pump, minimum 15 SEER
Heating equipment	Natural gas furnace 96% AFUE	Upgrade to Electric Heat Pump, minimum 8.6 HSPF
Heating equipment 12%	Natural gas boiler 78% AFUE	Upgrade to Electric Heat Pump, minimum 8.6 HSPF
Solar PV	None installed	Consider solar PV
Water Heater	Natural gas EF 0.62	Replace with heat pump hot water heater

Next page provides additional notes from your Home Energy Score Assessor

Additional Comments and Recommendations:

1 Shell Improvements correspond to recommendations that should be first steps in upgrading your home, including air sealing, insulation, duct sealing, etc. This estimate is calculated based on your current heating and cooling systems.

2 Full home electrification requires the removal of any fossil fuels from the home such as gas or wood burning. Calculations assume shell improvements are made and include heating and cooling recommendations. These upgrades can be made over time as equipment nears its end of life. Your actual energy use and costs may vary based on occupant behavior and other factors.

3 Energy savings calculations are estimates only and based on data collected by the assessor and modeled in the Home Energy Score tool. Calculations assume shell improvements are made and all fossil fuel equipment is changed to high-efficiency electric options. Estimated energy costs were calculated based on average utility prices for the nine Bay Area Counties ($0.31/kwh for electricity; $2.37/therm for natural gas; $2.67/gal for propane; $4.07/gal for fuel oil).

4 Your carbon footprint is based only on estimated home energy use. Carbon emissions are estimated based on utility and fuel-specific emissions factors provided by the California Public Utilities Commission. Your carbon footprint may be lower if you get your electricity through a Community Choice Aggregator (CCA) provider. For more information visit Cal-CCA.org.

Appendix B. State of Oregon Administrative Rules on Voluntary Building Energy Performance Score Systems

Department of Energy

Chapter 330

Division 63

VOLUNTARY BUILDING ENERGY PERFORMANCE SCORE SYSTEMS

330-063-0000
Purpose and Scope

These rules establish requirements of using a voluntary energy performance score system for the purpose of evaluating:

(1) Energy conservation and energy efficiency of new and existing residential buildings in Oregon; and

(2) Energy use in new and existing commercial buildings in Oregon.

Statutory/Other Authority: 2009 OL Ch. 750 (SB 79), ORS 469.703 & 469.040
Statutes/Other Implemented: 2009 OL Ch. 750 & ORS 469.703
History:
DOE 5-2014, f. 6-30-14, cert. ef. 7-1-14
DOE 6-2010, f. & cert. ef. 7-1-10

330-063-0010
Definitions

For the purposes of these rules, unless otherwise specified, the following definitions shall apply:

(1) “Asset rating” means a representation of the building’s energy efficiency or energy use generated by modeling under standardized weather and occupancy conditions.

(2) “Building” means any enclosed structure created for permanent use as a residence, a place of business, or any other activities whether commercial or noncommercial in character.

(3) “Building energy assessment” means a determination of a building’s energy use and energy efficiency by analyzing the building’s physical systems and assuming certain operational characteristics.

(4) “Commercial building” means a structure of which more than 50 percent of usable square footage is used or intended for use in the exchange, sale, or storage of goods, or the provision of services.

(5) “Department” means the State Department of Energy created under ORS 469.030.

(6) “Director” means the Director of the State Department of Energy appointed under ORS 469.040.

(7) “Energy performance score system” means a technical and administrative framework for producing and reporting metrics that describe the energy consumption, generation and efficiency of a building.

(8) “Home” means a residential building.

(9) “Home energy assessor” has the meaning given that term in ORS 701.527.

(10) “Home energy performance score” has the meaning given that term in ORS 701.527.

(11) “Home energy performance score system” means an energy performance score system designed and used for residential buildings and which meets the requirements of OAR 330-063-0015(1).

(12) “Operational rating” means a representation of a building’s energy use generated by measuring actual energy consumption taking into consideration all physical systems and their operation.

(13) “Physical systems” means any energy-consuming equipment integrated in the building design, function or operation.

(14) “Residential building” has the same meaning as “residential structure” as defined in ORS 701.005.

(15) “Oregon’s Home Energy Performance Score Standard” means a standard that meets all requirements in 330-063-0015.

Statutory/Other Authority: 2009 OL Ch. 750 (SB 79), ORS 469.703 & 469.040
Statutes/Other Implemented: 2009 OL Ch. 750 & 469.703
History:
DOE 6-2016, f. & cert. ef. 12-21-16
DOE 5-2014, f. 6-30-14, cert. ef. 7-1-14
DOE 6-2010, f. & cert. ef. 7-1-10

330-063-0015
Home Energy Performance Score System Requirements

(1) A home energy performance score system must:

(a) Generate a home energy performance score that meets the requirements of section (2);

(b) Generate a home energy performance report that meets the requirements of sections (3) through (5);

(c) Incorporate building energy assessment software, the output of which must be used to derive the information presented on the home energy performance report;

(d) Provide or specify required training in the use of the home energy performance score system for home energy assessors; and

(e) Establish minimum performance standards for quality assurance.

(2) A home energy performance score must be an asset rating that is based on physical inspection of the home or design documents used for the home's construction.

(3) A home energy performance report must include the following information:

(a) The U.S. Department of Energy's Home Energy Score and an explanation of the score;

(b) An estimate of the total annual energy used in the home in retail units of energy, by fuel type, generated by the U.S. Department of Energy's Home Energy Scoring Tool;

(c) An estimate of the total annual energy generated by on-site solar electric, wind electric, hydroelectric, and solar water heating systems in retail units of energy, by type of fuel displaced by the generation;

(d) An estimate of the total monthly or annual cost of energy purchased for use in the home in dollars, by fuel type, based on data provided by the Department for the current average annual retail residential energy price of the utility serving the home at the time of the report and the average annual energy prices of non-regulated fuels, by fuel type;

(e) The current average annual utility retail residential energy price in dollars, by fuel type, and the average annual energy prices of non-regulated fuels, by fuel type, provided by the Department and used to determine the costs described in subsection (d) of this section;

(f) At least one comparison home energy performance score that provides context for the range of possible scores. Examples of comparison homes include, but are not limited to, a similar home with Oregon's average energy consumption, the same home built to Oregon energy code, and the same home with certain energy efficiency upgrades.

(g) The name of the entity that assigned the home energy performance score and that entity's Construction Contractors Board license number if such a license is required by law;

(h) The date the building energy assessment was performed; and

(i) For reports that meet all requirements of this division, the statement "This report meets Oregon's Home Energy Performance Score standard." Reports generated by home energy performance score systems that have not been approved for use in Oregon according to OAR 330-063-0020 may not include this statement.

(4) Additional information that may be presented in a home energy performance report includes, but is not limited to:

(a) A home energy performance score described in section (2) that meets the requirements of OAR 330-063-0020, and an explanation of the score;

(b) A list of recommended energy efficiency upgrades for the building;

(c) A hypothetical home energy performance score representing the score the building would be expected to receive upon completion of the energy efficiency upgrades in subsection (4)(b);

(d) The estimated amount of carbon dioxide equivalent (CO_2e) emissions, in metric tons, resulting from the energy used in the home based on the carbon intensity, as reported on the department website, of the electricity provided by the electric utility that serves the home, natural gas and other fuel types used in the home.

(5) A home energy performance report must consist, at a minimum, of either:

(a) a printed document that presents all information required under section (3) on a single side of a single 8.5 by 11 inch page; or

(b) a downloadable electronic document that is formatted for printing and presents all information required under section (3) on a single side of a single 8.5 by 11 inch page.

Statutory/Other Authority: ORS 469.703 & 469.040
Statutes/Other Implemented: ORS 469.703
History:
DOE 6-2016, f. & cert. ef. 12-21-16
DOE 5-2014, f. 6-30-14, cert. ef. 7-1-14

330-063-0020
Review and Approval of a Home Energy Performance Score System

(1)(a) The director will appoint a stakeholder panel to recommend to the director whether to approve home energy performance score systems for use in Oregon.

(b) Members of the stakeholder panel may serve terms up to five years. Members may include but are not limited to:

(A) A chair from the Oregon Department of Energy;

(B) A representative from Energy Trust of Oregon;

(C) A representative from the U.S. Department of Energy;

(D) A representative from a provider of building energy assessment software;

(E) A representative from each home energy performance score system approved for use in Oregon;

(F) A representative from an investor-owned electric utility;

(G) A representative from a consumer-owned electric utility;

(H) A representative from a natural gas utility;

(I) A representative from the residential construction industry;

(J) A representative from the real estate industry;

(K) A representative from the appraisal industry; and

(L) A representative from an entity that provides training for building energy assessments.

(c) In its review of a home energy performance score system, the stakeholder panel must review all required elements of the home energy performance score system listed in OAR 330-063-0015.

(d) The stakeholder panel may recommend to the director criteria for approval of home energy performance score systems, criteria for approval of training and certification programs or work experience, and revisions to OAR 330-063-0015 that specify criteria for content and format of a standard energy metrics label to be included in all home energy performance reports.

(e) The stakeholder panel may develop a charter and operating procedures. The stakeholder panel must provide its recommendations to the director in writing and must include a description of any dissenting views of panel members. Recommendations should be based on consensus when possible.

(2) Home energy performance score systems must meet the requirements of OAR 330-063-0015, be reviewed by the stakeholder panel and be approved by the director prior to being used to assign home energy performance scores to homes in Oregon.

(a) An entity seeking approval for use of a home energy performance score system in Oregon must submit to the department a written request for review and approval. The request must include:

(A) A copy of or an internet link to the building energy assessment software used by the home energy performance score system;

(B) A sample of the home energy performance report generated by the home energy performance score system;

(C) A copy of test results demonstrating the accuracy of the building energy assessment software used by the home energy performance score system; and

(D) Other information that may be necessary for the stakeholder panel to make a recommendation to the director.

(b) Within 120 days of the department's receipt of a complete request, the stakeholder panel must complete its review of the home energy performance score system and provide its written recommendation to the director. If the stakeholder panel is unable to make a recommendation to the director within 120 days, department staff will make a recommendation to the director.

(c) Within 60 days of the director's receipt of the stakeholder panel's recommendation, the director will decide whether the home energy performance score system is approved for use in Oregon and provide that decision, including reasons for denying approval if approval is denied, in writing to the applicant. In deciding whether to approve a home energy performance score system for use in Oregon, the director will consider:

(A) Whether the system meets the requirements for home energy performance score systems in OAR 330-063-0015;

(B) The recommendation of the stakeholder panel, as well as dissenting views raised by one or more panel members;

(C) The test results of the building energy assessment software used by the home energy performance score system;

(D) The degree and nature of use of the system in the marketplace; and

(E) Any other information the director determines is necessary to make a decision whether to approve.

(3) The provider of a home energy score system that has been approved for use in Oregon must submit to the department a new written request for review and approval every time a substantive revision is made to the approved system. The request for review and approval must include supporting documentation describing the revision. The request will be reviewed by the stakeholder panel and considered for approval by the director according to the process and timelines described in subsections (2)(b) and (c). A home energy performance score system that has undergone a substantive revision may not be used to assign home energy performance scores to homes in Oregon until the director has provided written approval for the use of the revised system. Substantive revisions include significant changes to the building energy assessment methodology, significant changes to the derivation of the home energy performance score or the scale on which it is presented, and significant changes to the training and quality assurance requirements for home energy assessors.

(4) The department may, at any time, request from the provider of an energy performance score system documentation demonstrating that no substantive revisions have been made to the home energy performance score system since the system was last approved for use in Oregon. The provider must comply with the department's request within 60 days. If the provider cannot demonstrate that no substantive revisions have been made to the system since it was last approved, the provider must submit to the department a written request for review and approval that includes documentation describing the revisions. The request will be reviewed by the stakeholder panel and considered for approval by the director according to the process and timelines described in subsections (2)(b) and (c). The system may not be used to assign home energy performance scores to homes in Oregon until the director has provided written approval.

Statutory/Other Authority: 2009 OL Ch. 750 (SB 79), ORS 469.703 & 469.040
Statutes/Other Implemented: 2009 OL Ch. 750 & ORS 469.703
History:
DOE 6-2016, f. & cert. ef. 12-21-16
DOE 5-2014, f. 6-30-14, cert. ef. 7-1-14
DOE 6-2010, f. & cert. ef. 7-1-10

330-063-0025
Training Requirements for Home Energy Assessors

Individuals producing home energy performance scores must:

(1) Be certified as a home energy assessor by the Oregon Construction Contractors Board if required by ORS 701.529;

(2) Have completed training in the software program used to produce the U.S. Department of Energy's Home Energy Score; and

(3) Have successfully completed one of the following training and certification programs:

(a) Training and certification as a Building Performance Institute Building Analyst or Home Energy Professional Energy Auditor;

(b) Training and certification from the Residential Energy Services Network as a Home Energy Rater;

(c) Training and certification from the Oregon Training Institute as a Residential Energy Analyst;

(d) A professional credential recognized by the U.S. Department of Energy as a prerequisite for qualification as a Home Energy Score assessor; or

(e) Other training and certification program or work experience approved by the department. Requests for such approval must be submitted to the department in writing. The department may request information about the training and certification program or work experience from the requestor and will provide an approval decision to the requestor within 120 days of receipt of all requested information.

Statutory/Other Authority: ORS 469.703 & 469.040
Statutes/Other Implemented: ORS 469.703
History:
DOE 6-2016, f. & cert. ef. 12-21-16
DOE 5-2014, f. 6-30-14, cert. ef. 7-1-14

330-063-0030
Reporting Home Energy Performance Score Data

Home energy assessors must report to the department, at least annually, in a manner specified by the department, the following information about each home in Oregon to which they assigned a home energy performance score, unless the department is able to obtain the information from another source:

(1) The zip code and city from the home's site address, but not the street address;

(2) The characteristics of the home that were input into the building energy assessment software; and

(3) All information required by OAR 330-063-0015(3) to be in the home energy performance report.

Statutory/Other Authority: 2009 OL Ch. 750 (SB 79), ORS 469.703 & 469.040
Statutes/Other Implemented: 2009 OL Ch. 750 & ORS 469.703
History:
DOE 5-2014, f. 6-30-14, cert. ef. 7-1-14
DOE 6-2010, f. & cert. ef. 7-1-10

330-063-0040
Energy Performance Score System Standards for Commercial Buildings

(1) Persons producing energy performance scores must have completed training in the building energy assessment software and energy performance score system used to produce the score.

(2) Building energy assessment software used to produce the score must be approved the U.S. Department of Energy.

(3) An energy performance score for an existing commercial building must be an operational rating based upon the actual energy usage of the building and shall utilize utility data.

(4) An energy performance score for a new commercial building must be an asset rating based on the projected energy consumption of the building and may include a physical inspection of the building.

(5) An energy performance score must include an explanation of the score and the assumptions used to derive the score, the date of the score, and the name of the person that produced the score.

(6) Commercial energy use must be displayed in annual Kbtu per square foot as determined by approved energy modeling methods, using standard occupancy profiles for the building type. The annual energy consumption of each fuel (electricity, natural gas, oil, propane, etc) must be displayed in retail units.

(7) Energy performance score reports may include:

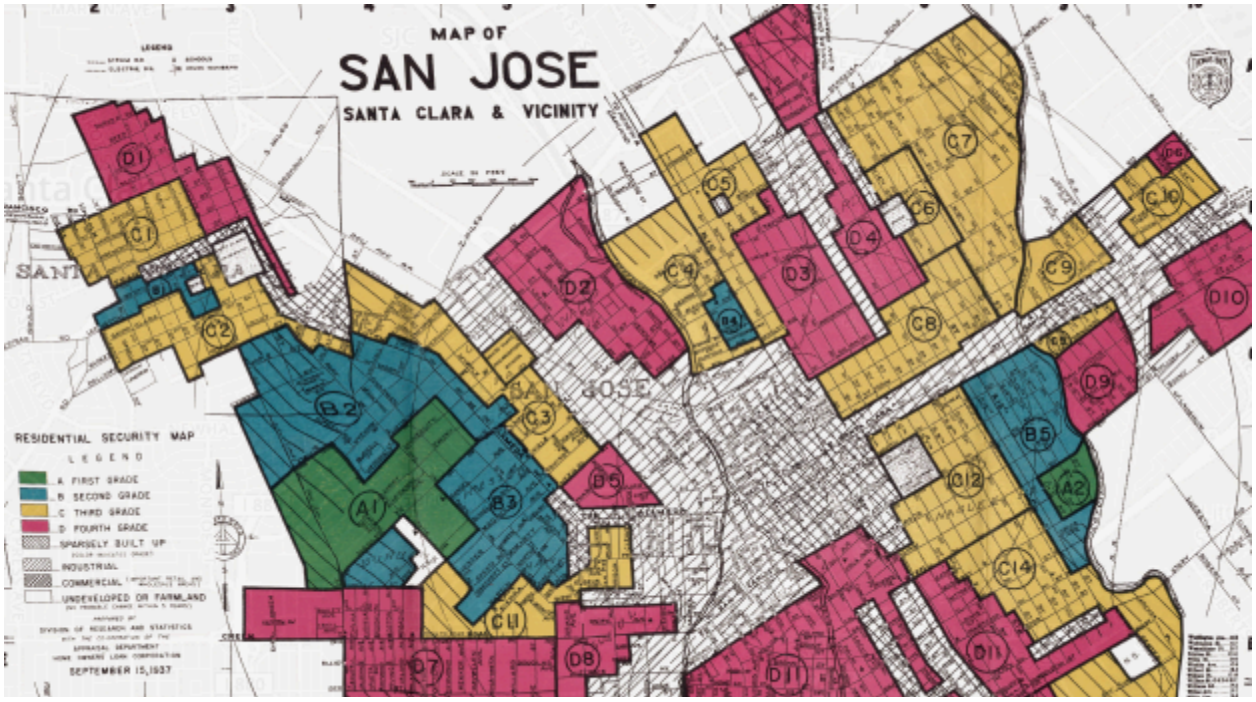
(a) A benchmark score based on a similar building built to state building code standards, a similar building that represents Oregon or national average energy consumption, or any other comparable building; and

(b) The estimated amount of carbon dioxide equivalent (CO2e) emissions, in metric tons, associated with the building's energy consumption based on the carbon intensity, as reported on the department's website, of the electricity provided by the electric utility that serves the building, natural gas and other fuel types used in the building.

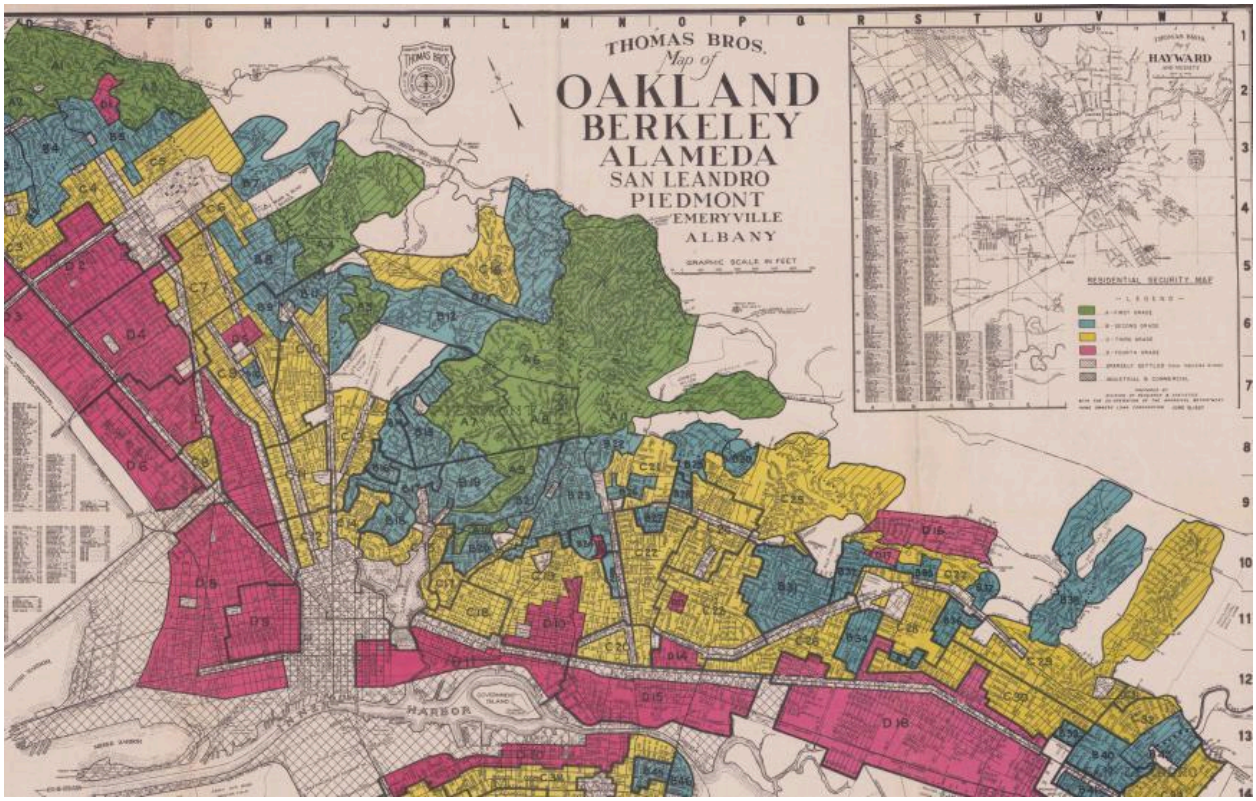
Statutory/Other Authority: 2009 OL Ch. 750
Statutes/Other Implemented: 2009 OL Ch. 750
History:
DOE 5-2014, f. 6-30-14, cert. ef. 7-1-14
DOE 6-2010, f. & cert. ef. 7-1-10

Appendix C. California Redlining Maps

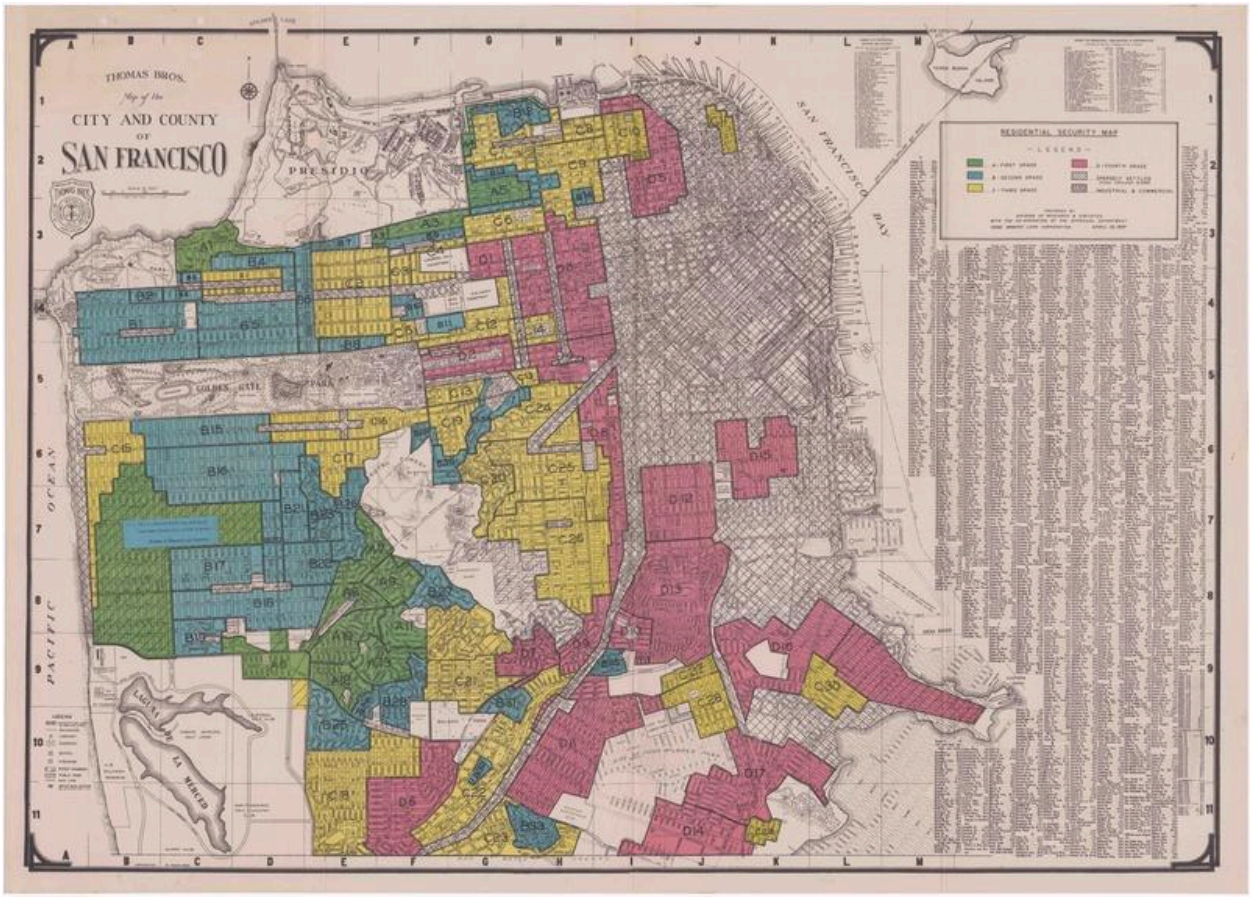
Each map includes a legend that applies an A, B, C, or D letter grade to neighborhoods as well as a color (green, blue, yellow, red, respectively).



Source: Article from SF Classical Voice.



Source: Article from KQED.



Source: Article from KQED.