



California Home Energy Rating System Program Phase II

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California Home Energy Rating System (HERS) Program

Established by Public Resources Code 25942:

- **Consistent, accurate, and uniform ratings based on a single statewide rating scale**
- **Reasonable estimates of potential utility bill savings and reliable recommendations on cost-effective measures to improve energy efficiency**
- **Training and certification procedures for home raters and quality assurance procedures to promote accurate ratings and to protect consumers**
- **Labeling procedures that will meet the needs of home buyers, homeowners, renters, the real estate industry, and mortgage lenders with an interest in home energy ratings**

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California HERS Program – Phase I

Initial implementation of the California HERS Program:

- **Adopted in 1999 - Field verification and diagnostic testing for compliance with Title 24 Building Energy Efficiency Standards**
- **Established basic framework for HERS Rater training, certification, and quality assurance**
- **Created infrastructure to deliver HERS rating services**
 - **3 HERS Providers approved by the Energy Commission**
 - **Over 1,000 HERS Field Verification Raters trained and certified statewide**
- **Widely used for field verification for Energy Efficiency Programs**
 - **California Energy Star Homes / Residential New Construction**
 - **New Solar Homes Partnership**
 - **Federal Tax Credits**
 - **Green Building Programs**

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California HERS Program – Phase II

Phase II - Effective September 1, 2009

Builds on and Extends Phase I Infrastructure:

- **Consistent, accurate, and uniform Whole-House Home Energy Ratings for newly constructed and existing homes based on a single statewide rating scale (single family homes and multi-family buildings of three stories or less)**
- **Labeling procedures to meet the needs of home buyers, homeowners, renters, the real estate industry, and mortgage lenders with an interest in home energy ratings**
- **Reasonable estimates of potential utility bill savings and reliable recommendations on cost-effective measures to improve energy efficiency**
 - **Methods for determining energy efficiency measure cost-effectiveness**
 - **Includes cross-checking against utility bills and recognizing non-energy benefits**

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Existing Home Opportunities

- **California has over 13 million residential dwelling units**
- **A majority were built before 1978 with limited energy efficiency measures**
- **There are significant opportunities for improving the energy efficiency of homes built after 1978**
- **Many energy efficiency measures are highly cost-effective**
- **Alerting homeowners to cost-effective measures can result in reducing their energy bills and achieving California energy and climate change goals**

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Rating Report Elements

A HERS Report consists of:

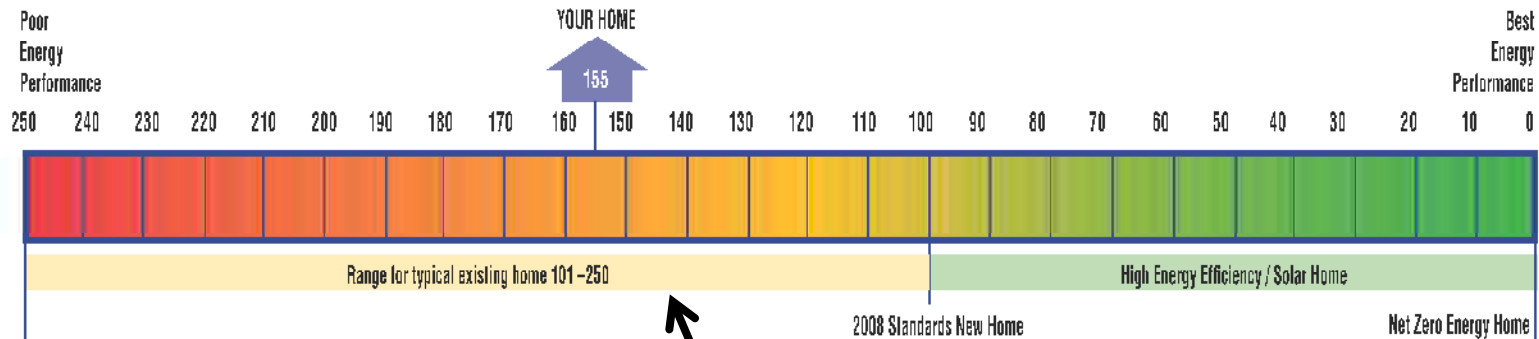
- **The Rating Certificate with the HERS Index**
- **Recommended improvements with estimated savings**
- **Historic and expected energy consumption**
- **Detailed listing of the features of the home that were used in the analysis**

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Sample Rating Certificate

California Home Energy Rating Certificate



<p>Information goes here on compliance with other programs:</p>	<p>Energy Impact</p> <p>Greenhouse Gas Emissions Carbon Dioxide xxx tons/year</p> <p>Energy Consumption Electricity (kWh/year) Cooling --- Lights --- Appliances --- Total ---</p> <p>Natural Gas (therms/year) Space Heating --- Water Heating --- Total ---</p> <p>Operating Cost (\$/year) Electricity --- Gas --- Total ---</p> <p>Renewable Energy Production None</p> <p>Ancillary Energy Uses Swimming pool --- Spa --- Landscape lighting ---</p>	<p>Site Information Address 123 Jones Street</p>	<p>Official Home Energy Rating in conformance with the requirements of the California Energy Commission</p>
	<p>Qualifying Information Goes Here:</p>	<p>Energy Insulation</p> <p>Windows</p> <p>Heating</p> <p>Cooling</p> <p>Water</p>	<p>HERS Index 155</p>

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Recommendation Report Includes

- **A descriptive list of the cost-effective recommendations for energy efficiency improvements based on the unique features of the home**
- **The projected annual energy savings for each recommended energy efficiency improvement**
- **The expected California HERS Index for each successive energy efficiency improvement**

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Energy Uses in Ratings & Recommendations

● Energy Uses Included in the Rating

- Space heating, space cooling, and water heating are produced by Title 24 compliance software
- Lighting and Appliances Model
 - Lighting – both interior and exterior lighting attached to the home
 - Appliances commonly used in the home

● Energy Uses Included in Recommendations but not in the Rating

- Pools
- Spas
- Lighted sports courts
- Well pumps

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Onsite Renewable Generation

- **Two ratings are required: one with the building's energy efficiency features and one with those features plus onsite renewable generation (e.g., photovoltaics)**
- **The California Energy Commission in its 2009 Integrated Energy Policy Report recommends a goal of achieving zero net energy newly constructed homes by 2020**
- **It is critically important to invest first in energy efficiency**
- **Onsite renewable generation should be included in the modeling of projected utility bills**

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California HERS Index

$$\text{HERS Index} = \frac{\text{TDV}_{\text{Rated}} - \text{TDV}_{\text{PV}}}{\text{TDV}_{\text{Reference}}} \times 100$$

- **TDV_{Rated}** = Time Dependent Valued (TDV) Energy Use of the Rated Home
- **TDV_{PV}** = TDV Energy Production of the On-Site Renewable Generation
- **TDV_{Reference}** = TDV Energy Use of the Reference Home

TDV means “Time Dependent Valued” Energy – energy saved during utility’s peak periods has greater value.

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ACM Modeling Rules

The modeling rules and assumptions specified in Chapter 3 of the 2008 Residential Alternative Calculation Method (ACM) Approval Manual shall be used to calculate the TDV Energy for the rated home and the reference home, except as otherwise stated in the HERS Technical Manual

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The California Home Energy Rating Process

1. Inspection of the existing conditions of the home's energy-related features
2. Analysis of the energy impact of those features
3. Identification of potential energy efficiency improvements for that home
4. Evaluation of the cost effectiveness of each improvement
5. Recommendations to the homeowner of the cost effective improvements
6. Designation of a rating of the comparative energy efficiency of the home
7. Production of a label that communicates the rating

Energy Audit

Whole-House Home Energy Rating

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Measures Considered in the Rating

- **Rate the Home not the Occupant**
 - Physical features of the home
 - Equipment likely to stay with the home
- **The Order Makes a Difference**
- **Building Envelope**
 - Examples: Insulation, envelope sealing, shading, Cool Roofs
- **Distribution System and Equipment Tuning**
 - Examples: Duct sealing, verified refrigerant charge & airflow
- **Lighting and Appliances Replacement**
 - Examples: Efficient lighting, refrigerator, dishwasher
- **Heating, Cooling and Water Heater Replacement**
 - Furnace, air conditioner, water heater (consider solar)
- **Photovoltaics**

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Measure Cost Effectiveness

Standard Approach

- **Determine cost effectiveness of measures using an after-tax cash flow method**
 - Use a 30-year fixed-rate mortgage based on rates published by Freddie Mac
 - Use a 30 percent combined Federal and State marginal tax rate

Custom Approach

- **Determine cost effectiveness from the perspective of the homeowner**

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The Oversight Role of HERS Providers

- **Three Energy Commission-approved Providers in California: CHEERS, CaCERTS, and CBPCA**
- **HERS Providers train, test, and certify Raters and provide quality assurance**
- **HERS Providers must maintain an arms-length relationship with the Raters to avoid conflicts of interest**
- **HERS Providers offer quality assurance by independently rating a sample of homes that have been rated, provide raters with feedback and follow-up with re-training or discipline if problems are found**

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California Whole-House Home Energy Rater

- **The rater is trained to perform both data collection and energy analysis functions**
- **Whole-House Home Energy Raters may manage Home Energy Analysts, using the analyst to operate approved HERS compliance software using data provided by the rater**
- **A California Home Energy Auditor is a Whole-House Home Energy Rater**

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California Home Energy Analyst

- **The Home Energy Analyst certification permits only the analysis portion of producing a home energy rating**
- **A Home Energy Analyst may:**
 - Model the energy usage of a home
 - Produce a Rating Report and Rating Certificate
 - Develop a recommendation report entailing standard recommendations, and, if desired, custom recommendations
 - **Produce a California Whole-House Home Energy Rating for newly constructed homes based on construction documentation and site verification by the Whole-House Home Energy Rater**
 - Partner with Whole-House Home Energy Raters who can collect data on energy efficiency features of existing homes
- **A Home Energy Analyst may not collect data from existing homes**

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HERS Raters and Building Performance Contractors

- **Raters must be “independent entities” – defined as having no “financial interest” – with the contractors who perform energy efficiency improvements on a home or the builder and contractors of a newly constructed home**
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- **The Building Performance Contractor must be certified as a California Whole-House Home Energy Rater and be a licensed class B General Building Contractor**
 - **The Building Performance Contractor is permitted to both rate homes and perform contracting work on the home to improve its energy efficiency**
 - **The Building Performance Contractor must comply with heightened disclosure and quality assurance procedures to protect consumers**

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Whole House Retrofits

- **CPUC has a goal to retrofit 130,000 homes in the next three years with an average energy savings of 20%**
 - Prescriptive Whole House Retrofit Program
 - Whole House Performance Program
- **CPUC has a goal of 40% average energy savings for all California homes by 2020**
- **CEC has proposed awards from the State Energy Program (SEP) that could result in 35,000 retrofits by March, 2012**
- **Municipal Utilities such as SMUD are also launching Home Performance Programs**
- **AB 811 PACE financing districts are being created in most areas of the state**

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HERS Phase II Implementation Efforts

● Development of Procedures

- HERS rating software
- Provider's training curriculum, data registry, cost database, and quality assurance program

● Second Edition of the HERS Booklet

- Anticipated for release in Fall 2010
- Explains the HERS Program and targets buyers, sellers, and real estate agents at the time-of-sale

● Planned Education and Outreach

- Addresses time-of-sale opportunity
- Focus on conducting home energy ratings when properties are up for sale
- Educates and brings awareness to the real estate agents of the value and cost of a home energy rating at the time-of-sale
- Expands education and awareness to homeowners, appraisers, and lenders

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Status of HERS II

- **Regulations went into effect September 1, 2009**
- **Two HERS Providers, CHEERS and CalCERTS, were re-certified for Field Verification and Diagnostic Testing for the 2008 Title 24, Part 6 Standards in November 2009. CBPCA was re-certified on April 7th for Alterations.**
- **HERS Providers need to submit complete applications including training materials for Whole-House approval and HERS Software that meets the requirements in the HERS Technical Manual**
- **Energy Commission staff are working with the HERS Providers and HERS Software vendors to get their systems approved**
- **After Energy Commission approval of a HERS Providers Rating Program, the Providers will then train and certify HERS Whole-House Home Energy Raters**

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HERS Program and Contact Information

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HERS Website:

- <http://www.energy.ca.gov/HERS/>

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