

Pilot States Program Report: Home Energy Rating Systems and Energy-Efficient Mortgages

Barbara C. Farhar, Ph.D.



NREL

National Renewable Energy Laboratory

1617 Cole Boulevard
Golden, Colorado 80401-3393

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Preface

The research on which this report is based was managed and conducted at the National Renewable Energy Laboratory (NREL). It was funded by the U.S. Department of Energy (DOE). The cognizant DOE program managers for this effort are David Boomsma and Michael J. McCabe.

Several researchers contributed to the study: Patricia Plympton and John Bonitz, NREL; Nancy Collins, Q⁴ Associates; and Roberta Ward Walsh, Florida Gulf Coast University. Drs. Collins and Walsh, along with Ms. Plympton and the author, interviewed the HERS providers in the HERS/EEMs pilot states.

Several individuals contributed to the study. Foremost are the respondents in the HERS/EEMs pilot states and federal agencies who provided much of the data included. Among pilot states respondents are Barbara Collins in Alaska, Jeremiah Gardner in Arkansas, Megan Edmunds in Colorado, Michael Hodgson and Carroylin Threlkel in California, Linda Perry in Mississippi, Richard Faesy in Vermont, and Christine Lowrie in Virginia. Mortgage data were provided by the U.S. Department of Housing and Urban Development (HUD), Federal Housing Administration, the U.S. Department of Veterans Affairs, and U.S. Department of Agriculture Rural Housing Service.

Reviewers include: Mark Ginsberg, David Boomsma, and Michael J. McCabe, DOE; Robert Groberg, HUD; Ron Judkoff, Patricia Plympton, and John Bonitz, NREL; John Reese; Barbara Collins, Energy Rated Homes of Alaska; Megan Edmunds, E-Star Colorado; Michael Hodgson, ConSol, Inc., California; Richard Faesy, Energy Rated Homes of Vermont; Christine Lowrie, Virginia Home Energy Rating Organization; Steven Lowrie, National Home Energy Resources Organization; and Linda Perry, Energy Rated Homes of Mississippi. Stuart Smoller, Jill Anderson, Susan Sczepanski, and Kay Vernon completed the report's editing, graphics, and word processing.

Executive Summary

In the United States, more than \$100 billion is spent annually to provide energy to American homes. Improving the energy efficiency of the U.S. housing stock can result in significant benefits for homeowners, the economy, and the environment. Energy-efficient homes are typically more comfortable, better constructed, more fire-resistant, less expensive to operate, and they introduce fewer harmful emissions to the environment than a home built to conventional standards. Energy-efficient homes also retain their value better and can be more affordable if borrowers take advantage of a variety of energy-efficient mortgage products available only with houses that meet energy efficiency criteria. In addition, builders can build houses and market them as energy efficient to increase their market share, and real estate professionals can increase their commissions by selling houses that have the additional energy-efficient features. However, energy efficiency is often not as important in the home-buying decision as are other factors, such as location, number of bedrooms, air conditioning, and other amenities.

One reason for this is that home builders and home buyers have a strong tendency to minimize the “up-front” cost of a new property, even at the expense of future savings. Another reason that energy efficiency technologies are not more widely used may be that homeowners may not be aware of the cost-effectiveness of these technologies or how they can improve the efficiency of their homes. A third reason is that conventional mortgage loan practices do not consider the lower total cost of owning an energy-efficient home when energy expenses are added to mortgage and tax payments.

Two tools that can help improve the energy efficiency of the nation’s housing stock are home energy ratings systems (HERS) and energy-efficient mortgages (EEMs). A home energy rating is a standardized system for rating the energy efficiency of residential buildings. The home energy rating is a standard measurement of a home's energy efficiency. Most home energy ratings involve an on-site inspection of a home by a trained and certified residential home energy rater. The home energy rater inspects the home and measures its energy characteristics, such as insulation levels, window efficiency, wall-to-window ratios, the heating and cooling system efficiency, the solar orientation of the home, and the water-heating system. For most home energy ratings systems, the measurements are then entered into a computer program that produces a report of the cost-effective options for improving the home’s energy efficiency, as well a “rating” of the home’s energy efficiency and estimated energy costs.

An energy-efficient mortgage is any home mortgage for which the underwriting guidelines have been adapted specifically for energy efficiency features, or for which any form of financing incentive is given for energy efficiency. Several of the lenders offering EEMs require that a home energy rating be performed to verify that the energy efficiency of the home warrants an EEM.

Although the idea of using EEMs to spread the initial cost of improvements over time, thus reducing a major hurdle for homeowners, has existed since the early 1980s, the mortgage industry was reluctant to make loans for energy improvements without verified energy cost savings. And HERS, also in use since the 1980s, was not systematically used as a basis for mortgage lending.

In October 1992, Congress passed the Energy Policy Act of 1992 (EPACT), which provided for the establishment of credible voluntary national guidelines for residential energy rating systems (hereafter called home energy rating systems) and for a pilot test of EEMs through federal loan instruments in five states. In support of EPACT, the U.S. Department of Energy (DOE) initiated two paths: (1) working with stakeholders, DOE acted to develop a set of credible technical guidelines that could be used on a voluntary basis to provide accurate outputs on energy improvements and cost savings for homeowners and mortgage lenders; and (2)

working with the HERS providers in seven states, DOE developed a program to link HERS with EEMs in the states and to evaluate the program's progress. This report focuses on the second path.

Following the guidelines established in EPACT, the U.S. Department of Housing and Urban Development (HUD) selected five states for an EEMs pilot program—Alaska, Arkansas, California, Vermont, and Virginia. DOE funded a lead HERS provider organization in each of these states, as well as Colorado and Mississippi, as HERS/EEMs pilot states whose purpose was to increase the use of HERS and EEMs. The HERS provider organizations were funded to recruit and train raters, process ratings, and provide assistance to other states that wanted to start HERS programs.

HERS activity is widespread in the United States, in part because of the efforts of the pilot HERS provider organizations. The number of states with home energy ratings available has increased from 17 in 1993 to 47 in 1999. Between 1993 and 1998, 63,165 ratings were completed in the seven pilot states, and 8,428 Federal Housing Administration/HUD EEMs were completed. At the end of 1998, 328 trained and certified raters were active. Currently, the cost of delivering ratings is higher than the fees charged for ratings, resulting in a net loss for each rating performed. In the HERS/EEMs pilot program, a subsidy was provided that covered the difference.

Although each of the pilot states' circumstances are different, a few common themes appeared during the five years of the pilot program. HERS providers with the following characteristics had a higher market penetration of home energy ratings:

- High levels of funding over relatively short time periods
- State-funded financial incentives for energy efficiency financing for mortgage borrowers
- Financial incentive for lenders to market EEMs
- Diversification of services
- Continuity in HERS program leadership
- Active involvement of key stakeholders.

Overall, most of the HERS provider organizations in the pilot states believe that federal funding—along with a national marketing campaign and public service announcements—are needed to support their activities. All of the HERS provider organizations believe that federal programs, such as the ENERGY STAR Homes program, should be required to use ratings for their certifications.

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Introduction

Two tools that can help improve the energy efficiency of the nation's housing stock are home energy ratings systems (HERS) and energy-efficient mortgages (EEMs). A home energy rating is a standardized system for rating the energy efficiency of residential buildings. The home energy rating is a standard measurement of a home's energy efficiency. Most home energy ratings involve an on-site inspection of a home by residential energy efficiency professional, a home energy rater. Home energy raters are typically trained and certified by the operating HERS. Many home energy raters have backgrounds in the housing or energy fields and include experience as home inspectors, appraisers, energy auditors, low-income weatherization contractors, and energy-efficient home builders and designers. The home energy rater inspects the home and measures its energy characteristics, such as insulation levels, window efficiency, wall-to-window ratios, the heating and cooling system efficiency, the solar orientation of the home, and the water-heating system. Diagnostic testing, such as blower door for air leakage and duct leakage testing, is often part of the rating. For most home energy ratings systems, the measurements are then entered into a computer program that produces a report of the cost-effective options for improving the home's energy efficiency, as well a "rating" of the home's energy efficiency and estimated energy costs.

An EEM is any home mortgage for which the underwriting guidelines have been adapted specifically for energy efficiency features, or for which any form of financing incentive is given for energy efficiency. Several lenders who offer EEMs require that a home energy rating be performed to verify that the energy efficiency of the home warrants an EEM.

In the early 1990s, the U.S. Department of Energy (DOE) initiated action to link EEMs with home energy rating systems. The idea of using EEMs to spread the first cost of improvements over time, thus reducing a major hurdle for homeowners, had been in existence since the early 1980s. But the mortgage industry was reluctant to make loans for energy improvements unless the energy improvements actually saved on borrowers' monthly energy costs. HERS had also been used during the 1980s, but had not been systematically tied to mortgage lending. DOE, in cooperation with the U.S. Department of Housing and Urban Development (HUD), convened the National Collaborative on Home Energy Rating Systems and Mortgage Incentives for Energy Efficiency in 1991. Its mission, completed in 1992, was to reach consensus on a voluntary national program to link credible HERS with mortgage incentives for energy-efficient housing (HERS/EEMs National Collaborative 1992a, 1992b). Widespread availability of EEMs, combined with accurate HERS, was intended to make it easier and more affordable for Americans to live in energy-efficient homes.

A few months after the Collaborative's *Blueprint for Action* was published, Congress passed the Energy Policy Act of 1992 (EPACT), which provided for the establishment of credible voluntary national guidelines for residential energy rating systems (hereafter called home energy rating systems) and for a pilot test of EEMs through Federal loan instruments in five states. In carrying out its part of the mandate under EPACT, DOE initiated two parallel paths:

- Working with stakeholders, DOE acted to develop a set of credible technical guidelines that could be used on a voluntary basis to provide accurate outputs on energy improvements and cost savings for homeowners and mortgage lenders.
- DOE, working with the HERS providers in the pilot states selected by HUD (Alaska, Arkansas, California, Vermont, and Virginia), developed a program to link HERS with EEMs in the states and to evaluate the program's success.

The first path, on technical guidelines, is described in Plympton (2000) on the national status of HERS/EEMs. This report covers the second path taken by DOE, on institutionalizing the use of HERS to provide a technical basis for mortgage lending to pay for energy improvements in housing.

The HERS/EEMs Pilot State Programs

A HERS program already existed in each of the pilot states selected by HUD in 1993. These were as follows:

- Alaska: Alaska Housing Finance Corporation (AHFC) and Energy Rated Homes of Alaska (ERH-AK)
- Arkansas: Energy Rated Homes of Arkansas (ERH-AR)
- California: California Home Energy Efficiency Rating System (CHEERS)
- Vermont: Energy Rated Homes of Vermont (ERH-VT)
- Virginia: Virginia Home Energy Rating Organization (V-HERO)

DOE worked with the HERS provider organizations in each of the pilot states to foster the development of infrastructures to provide home energy ratings and to link rating outputs with EEMs.

The HERS/EEMs Pilot States Working Group and the Evaluation Working Group

After HUD selected the original five EEMs pilot states, DOE convened a Pilot States Working Group (PWG), attended by the HERS provider program directors. The Working Group's purpose was to provide a forum in which the HERS providers could share information and common problems, and seek solutions to those problems. In addition, it provided a venue for HUD's director of Single-Family Housing to provide details on the ways in which the EEMs would be put into practice and to discuss HUD's efforts to promulgate the EEM to loan underwriters. The PWG met several times during 1993 and 1994.

Stemming from the PWG, an EEMs Evaluation Working Group (EWG) met three times during the spring of 1994.¹ The EWG identified important research questions; defined measures of success, identified data sources; and helped devise an evaluation strategy, data collection plans, and management responsibilities for the evaluation; and reviewed drafts of an evaluation plan. The EWG provided a forum to link HERS and mortgage data and helped ensure that evaluation results are consistent and comparable across the pilots.

¹Participants included representatives from the pilot states, HUD/Federal Housing Administration (FHA), utility companies, the U.S. Department of Agriculture's Rural Housing Service (formerly the Farmers Home Administration), U.S. Environmental Protection Agency (EPA), U.S. Department of Energy, Energy Rated Homes of America (ERHA), California Energy Commission, Alliance to Save Energy, Federal National Mortgage Association (Fannie Mae), state energy offices, federal power administration, universities, and national laboratories.

Evaluation Methods

The EWG's evaluation plan has guided data collection on HERS/EEMs programs. The data used in this report were provided during the course of several years by the HERS provider organizations in the HERS/EEMs pilot states. (See Appendix B for a listing of these organizations and the key HERS provider contacts.) In preparation for this report, which updates earlier evaluation reports (Collins, et al. 1994; Collins, Farhar, and Walsh 1996; Farhar, Collins, and Walsh 1996, 1997), the program directors were interviewed at length during 1999, and they also provided once again the quantitative information on program characteristics (such as budgets) and accomplishments (such as the number of ratings completed) that had been gathered previously. The HERS providers reviewed the numerical information for accuracy.

The data on EEMs were obtained from HUD/FHA's Computerized Housing Underwriting Management System (CHUMS), which records mortgage data nationwide for FHA's loan products. Although these data are known to have problems,² they derive from the only relatively consistent source of information on the number of EEMs in the nation. Other federal EEM programs (those offered by the U.S. Department of Veterans Affairs and the Rural Housing Service) do not use home energy ratings as a basis for their EEMs. Although the Federal National Mortgage Association, or Fannie Mae, and the Federal Home Loan Mortgage Association, or Freddie Mac, use rating outputs for their pilot programs, they do not use ratings for the 2% debt-to-income ratio stretch, and they do not earmark EEMs in their databases. The Alaska Housing Finance Corporation (AHFC) keeps data on its Alaska EEMs, which are based on ratings.

Barriers to Progress

Many barriers to widespread use of HERS/EEMs have been identified. The major barriers appear to include:

- Lack of lender incentives (no need to offer EEM product to make money—low interest rates have led to refinancing boom and, later, housing boom; EEMs are perceived as an extra “hassle” that lenders have no incentive to pursue; an \$8,000 increment in a mortgage does not result in much profit for lenders unless done in volume; few HUD/FHA quotas for EEMs; EEMs not used for HUD Homes)³
- Lender risk aversion (fear that increasing loans to 110% of market value will result in financial loss in the event of default; uncertainty that housing operating costs will actually be reduced; fear that EEMs will not be marketable to banks' own investors, even if Fannie Mae and Freddie Mac purchase them)
- Lack of data on comparables, defaults, and on which loans are energy-efficient loans
- Lack of builder incentives (EEMs do not fit the way builders arrange their financing with banks; builder reluctance to change construction techniques; builders want nothing to interfere with their production schedule and dates of closing; builder perception that home buyers do not care about energy efficiency)

²See footnote 9.

³HUD Homes are homes with loans insured by FHA that had to be repossessed because of foreclosures; the agency sells the homes as quickly as possible.

- Lack of customer awareness of EEMs and energy efficiency benefits and concomitant lack of customer demand; EEMs only make a difference between a borrower qualifying and not qualifying for a loan in a small percentage of the real estate lending market (perhaps 7%)
- Insufficient builder, lender, and real estate professional awareness and training
- Low utility rates (both gas and electric)
- Lack of sufficient funding to institutionalize ratings, advertise to customers, and develop a national HERS industry
- Lack of EEMs uniformity
- Cost of home energy ratings (subsidies by federal and state governments needed to pay for costs of production)
- To date, limited participation in energy efficiency financing on the part of the secondary mortgage markets.

Brief Overview of the Report

This report covers the accomplishments of the HERS/EEMs pilot states from 1993 through 1998,⁴ including such indicators as funding, ratings and EEMs achieved, active raters, and training and marketing activities. A brief description of each HERS program's evolution is included, as well as their directors' views of the programs' future prospects. Finally, an analysis is provided of successful HERS program characteristics and factors that appear to contribute to HERS program success.

⁴The original five EEMs pilot states were designated by HUD in May 1993; HERS provider organizations in Mississippi and Colorado were funded by DOE beginning in FY 1996.

Accomplishments

How well have the HERS programs realized the national goal of linking home energy ratings with energy efficiency financing? This section discusses the many roles that the HERS programs played in their effort to link and spread the use of ratings and EEMs. Data are presented on the human resources developed; the ratings accomplished; the marketing, training, and education conducted; and the EEMs achieved. The extent to which ratings have been used in energy efficiency financing in the HERS/EEMs pilot states is also described.

Ratings

The number of residential ratings completed during the pilot program is one indicator of their effectiveness. Figure 1 and Table A-2 (in Appendix A) show the raw numbers of ratings completed by the pilot states. A total of 63,165 ratings have been completed in the seven pilot states from 1993 through 1998.⁵ The highest number of ratings occurred in California (23,645); Virginia completed the next most, at 18,410 ratings. However, the pilot states vary substantially in population.

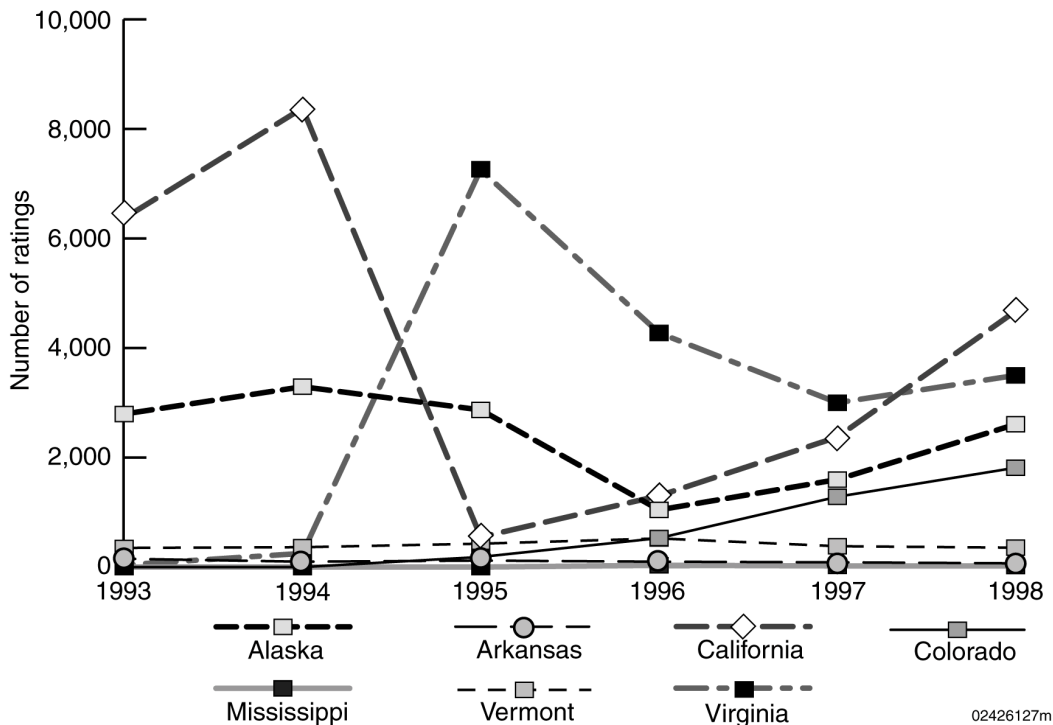


Figure 1. Ratings Completed in HERS/EEMs Pilot States by Year, 1993–1998

⁵Alaska, Arkansas, Colorado, Mississippi, Vermont, and Virginia process ratings performed in other states; these are not counted in the totals.

Because the states in which the pilot programs operate vary considerably in population,⁶ normalizing the number of ratings permits a more adequate assessment of rating performance. Figure 2 presents the number of ratings, counted cumulatively from 1993 through 1998, as a percentage of total number of households in 1998 by pilot state. The figure shows that, proportionally, Alaska had the highest number of ratings at 6% of the total number of households in 1998. Ratings in the other pilot states amounted to less than 1% of total households, although HERS were not offered in Colorado and Mississippi until 1996.

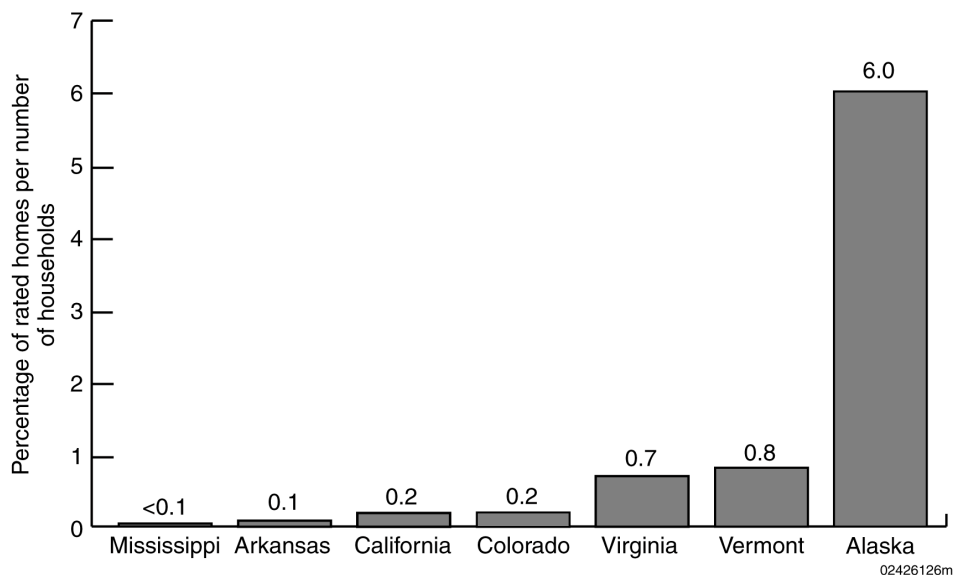


Figure 2. Percentage of Cumulative Ratings per Total Number of Households in 1998 by Pilot State⁷

EEMs

The number of EEMs completed during the pilot program is another indicator of their effectiveness. From FY 1994 through FY 1998, a total of 8,534 FHA EEMs were completed in the seven pilot states, with a total value of \$902.35 million.

The HERS providers also spent part of their resources to educate themselves about EEMs programs and to design HERS outputs that would work well with EEMs processes. Mortgage activities in the HERS/EEMs pilot states are summarized in Table A-3 (in Appendix A) for FHA and U.S. Department of Veterans Affairs loans and EEMs. Figure 3 shows that, nationwide, EEMs—showing low market penetration—amounted to approximately 1.5% of FHA loans in FY 1998.

⁶1998 population: Alaska—614,010; Arkansas—2,538,303; California—32,666,550; Colorado—3,970,971; Mississippi—2,752,092; Vermont—590,883; Virginia—6,791,345 (U.S. Bureau of the Census, *State Population Estimates and Demographic Components of Population Change: July 1, 1997 to July 1, 1998*.)

⁷Household data from <http://www.census.gov/population/estimates/housing/sthuhh1.txt>, Table ST-98-46, Estimates of Housing Units, Households, Households by Age of Householder, and Persons per Household: July 1, 1998, U.S. Census Bureau, Internet release date: 12/8/99; accessed 12/27/99.

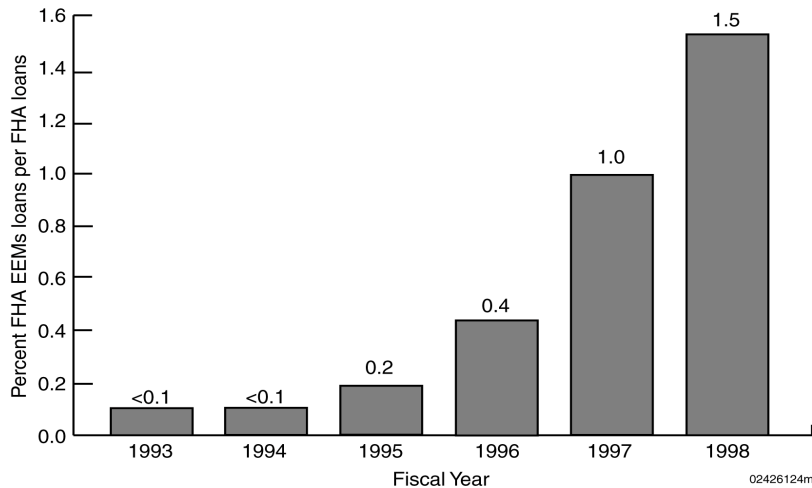


Figure 3. FHA EEMs as a Percentage of Total FHA Loans by Fiscal Year⁸

Figure 4 shows the number of FHA EEMs as reported in the FHA CHUMS database for FY 1993 through FY 1998 for the HERS/EEMs pilot states. The raw numbers of EEMs are also reported in Table 1. FHA reports no EEMs for Colorado and Mississippi until FY 1996, after their HERS programs were in operation. Nevertheless, California (6,042), Colorado (1,106), and Virginia (819) have the most EEMs completed between FY 1993 and FY 1998. The number of EEMs reported in Colorado rose from 143 in FY 1997 to 930 in FY 1998, more than a 600% increase in one year, a much higher increase than that in any other pilot state. These numbers should be approached with caution because of a degree of inaccuracy in the FHA CHUMS data.⁹

Figure 5 shows that Colorado and Arkansas have the relatively highest penetration of FHA EEMs, when the data are normalized by the number of FHA loans in the state, at 2.3% each. California (1.3%) and Mississippi (1.2%) have FHA/EEMs penetration near the national average. Normalized penetration rates of FHA EEMs in Virginia (0.9%), Alaska (0.8%),¹⁰ and Vermont (0.6%) are the lowest among the pilot states, at least based on the FHA CHUMS data.

⁸FHA penetration varies by state, and FHA data alone are not the only indicator of EEM activity. Certain states, most notably Alaska and Vermont, have state energy efficiency financing programs and FHA EEMs are not a significant component of energy efficiency financing in these states.

⁹There are problems with the accuracy of EEMs reporting in the FHA CHUMS database. For a detailed explication of these problems, see Farhar, Collins, and Walsh (1997), pp. 47-48. The problems include lack of training for underwriters and others in properly recording EEMs. The net result is that EEMs are both under- and overreported; that is, some loans that are not actually EEMs are counted as EEMs, and some loans that are actually EEMs are not counted as EEMs. The magnitude of the error in each direction remains unknown, but may balance itself out, according to one HUD official.

¹⁰The data for the AHFC EEMs are not included because they are not FHA EEMs and would not be counted in the CHUMS data base. If both FHA and AHFC EEMs were counted, 8.7% of all loans in Alaska would be EEMs.

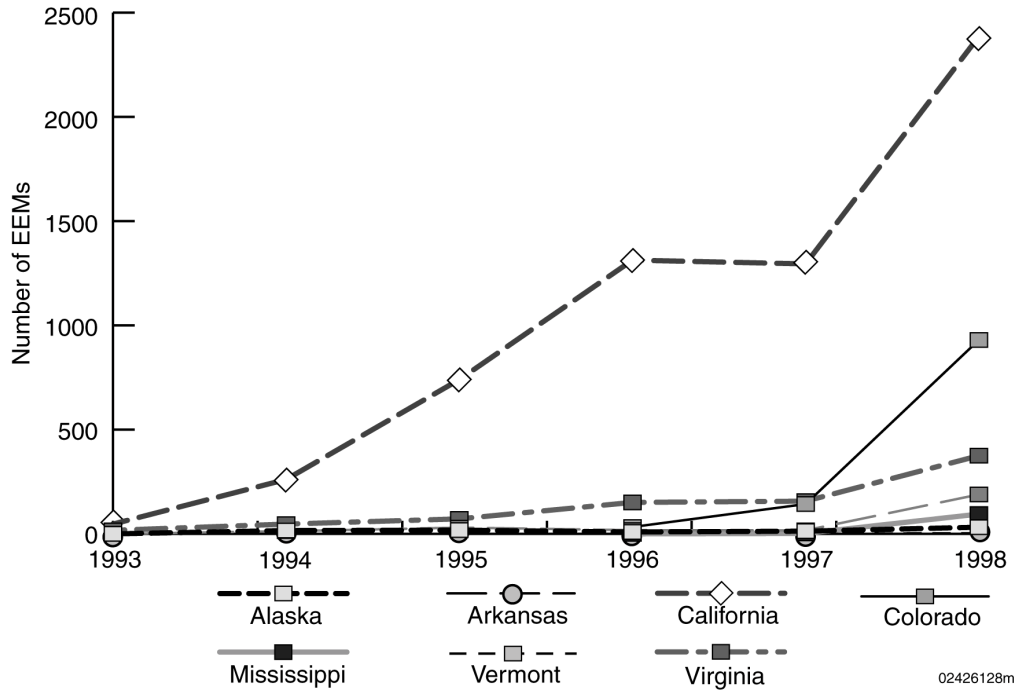


Figure 4. FHA EEMs by HERS/EEMs Pilot State, 1993–1998

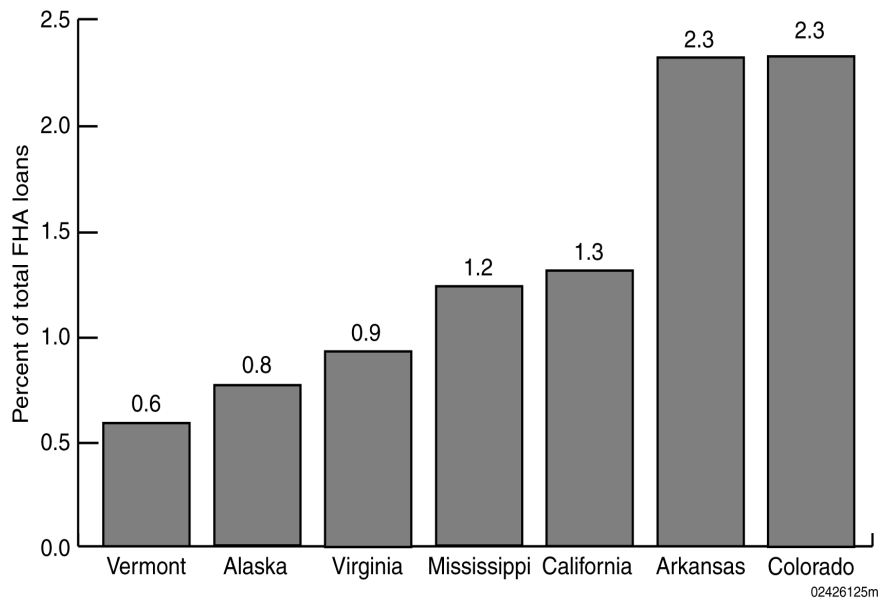


Figure 5. Percentage of FHA EEMs per Total FHA Loans for 1998, by HERS/EEMs Pilot State

Ratings Linked with EEMs

Table 1 documents the number of ratings and FHA EEMs in each of the pilot states from 1993 through 1998.¹¹

**Table 1. Comparison of Number of Ratings with Number of FHA EEMs
in the HERS/EEMs Pilot States, 1993–1998**

State	1993		1994		1995	
	CY HERS	FY FHA EEMs	CY HERS	FY FHA EEMs	CY HERS	FY FHA EEMs
Alaska	2,794	0	3,293	16	2,869	189
Arkansas	152	0	98	13	119	30
California	6,369	47	8,378	261	548	740
Colorado	--	--	--	--	185	--
Mississippi	--	--	--	--	--	--
Vermont	350	0	363	3	427	0
Virginia	40	17	250	47	7,345	72

State	1996		1997		1998		Totals	
	CY HERS	FY FHA EEMs	CY HERS	FY FHA EEMs	CY HERS	FY FHA EEMs	CY HERS**	FY FHA EEMs
Alaska (both)	1,044		1,598		2,607		14,205	
<i>AHFC Program*</i>	<i>416</i>	<i>154</i>	<i>1,021</i>	<i>594</i>	<i>2,092</i>	<i>1,151</i>		<i>1,899</i>
ERH-AK Program	628	9	577	12	515	32		258
Arkansas	98	18	87	17	69	189	623	267
California	1,302	1,313	2,374	1,295	4,674	2,386	23,645	6,042
Colorado	529	33	1,284	143	1,814	930	3,812	1,106
Mississippi	32	0	21	2	19	95	72	97
Vermont	523	1	381	2	354	3	2,398	9
Virginia	4,275	151	3,000	157	3,500	375	18,410	819

*AHFC ratings and AHFC EEMs only; italicized figures do not include ERH-AK ratings nor FHA EEMs.

**See Table A-2 in Appendix A.

¹¹The relationship between the number of ratings and the number of EEMs is approximate only, because ratings are reported on a calendar year (CY) basis, and mortgages on a fiscal year (FY) basis.

In most of the pilot states, many more ratings are being completed than are apparently being used for FHA EEMs. Although HERS are required by FHA for EEMs to be issued, many EEMs are apparently being issued without ratings, at least from the HERS provider organizations in the state of mortgage issue.¹² The best available data show that in Arkansas and Mississippi, more EEMs are being reported than there are ratings being completed.¹³ Several factors could affect these counts. As noted earlier, there are EEMs reporting problems in the CHUMS data system. Also, there may be inaccuracies in the rating data reported by the pilot states. In addition, the two kinds of data are off by six months. Nevertheless, these are the only data available on the incidence of EEMs in the nation and in the HERS/EEMs pilot states.

The EEMs offered through the Alaska Housing Finance Corporation, with a quarter-point interest break, are apparently the most successful EEMs being offered in the pilot states. The AHFC program completed 4,000 and committed \$13.8 million for interest rate reductions on EEMs during the past three years, because the AHFC program was separated from the ERH-AK program. The AHFC has markedly increased the number of its mortgage loans for energy-improved housing. Table 2 shows the number of loans and interest rate reductions achieved.

Table 2. Number of Loans and Amounts of Interest Rate Reductions Achieved, AHFC EEM Program (AHFC Loans), 1993–1998

Year	Number of Loans	Funds Committed (\$)
1993	55	354,620
1994	394	2,423,856
1995	287	1,670,112
1996*	154	1,095,051
1997	594	4,241,238
1998	1,151	8,453,334
Totals	2,635	18,238,211

*1996 was the first year that the AHFC program was separate from the ERH-AK program.

¹²Some of the ratings used in EEMs could have been done in prior years or by organizations other than the HERS provider organizations studies, which would affect the counts. For example, if the National Home Energy Resources Organization (N-HERO) performed a rating for a California home that was ultimately used to qualify a California borrower for an EEM, this rating would not be included in the count of ratings for California. Nevertheless, based on anecdotal information, the impact of the N-HERO ratings on the numbers of ratings and EEMs reported for each pilot state is estimated to be small.

¹³The Colorado HERS program director reports anecdotal information that homeowners may use rating information to decide on the best energy improvements without obtaining mortgages to make the improvements.

Raters

As noted, home energy raters are generally trained and certified by the operating HERS. Typically, home energy raters have backgrounds in the housing or energy fields and include experience as home inspectors, appraisers, energy auditors, low-income weatherization contractors, and energy-efficient home builders and designers. The HERS programs had to train and certify raters to accurately complete ratings, as well as educate customers. In the past three years, 69 additional raters were added to the pool of trained raters, for a total of 328 raters in the seven pilot states. Table 3 presents the data for the number of raters in 1995 and again in 1998.¹⁴ Rater training, in most cases, takes one week of classroom work, field activities, and testing. Responsibility for rater certification varies by state. Depending on location, some raters are able to work full time, but this is the exception rather than the rule. The number of raters is lower than the number trained because not all of those trained and certified actively conduct ratings. In most cases, raters work independently of the HERS programs and receive referrals from them. Raters are also in competition with each other for business.

Table 3. Raters in HERS/EEMs Pilot States

Pilot State	Number of Raters	
	As of 12/31/95	As of 12/31/98
Alaska	24	50
Arkansas	13	46
California	82	37
Colorado	46	55
Mississippi	--	10
Vermont	16	3
Virginia	78	127
Total	259	328

Source: Data are from the HERS/EEMs pilot states HERS provider organizations.

Rating Software

When the pilot program began, the Energy Rated Homes of America HERS providers (all of the original five pilot states except California) were using EZ Rater software. The HERS providers spent part of their resources to develop technical rating guidelines and software (see Table 4).

¹⁴The number of raters trained by the HERS provider organizations exceeds the number of active raters, indicating that many trained raters do not stay active for long.

Rating software has improved over the past five years because of the advent of rating software package testing using Building Energy Simulation Test (BESTEST) to determine their accuracy in measuring the variables they purported to measure (Judkoff and Neymark 1995a, b, c). The most recently developed software package in the pilot states, Colorado’s Rating Management Software (RMS), completed during 1999, is built around DOE-2.¹⁵

Table 4. Rating Software Used in the HERS/EEMs Pilot States, 1998

HERS/EEMs Pilot State	Rating Software
Alaska	
<i>Alaska Housing Finance Corporation</i>	<i>AK Warm</i>
<i>Energy Rated Homes of Alaska</i>	<i>EZ Rater—Alaska version</i>
Arkansas	EZ Rater and REM/Rate
California	CHEERS, Rated Energy Plus MICROPAS
Colorado	Rating Management Software
Mississippi	REM/Rate
Vermont	REM/Rate
Virginia	RateView

Marketing, Training, and Education

The HERS providers spent part of their resources to market both ratings and EEMs, and to develop the infrastructure needed in the marketplace for an effective HERS/EEMs program (see Table 5). The HERS provider organizations provided data on the housing industry professionals they trained during the course of the pilot program, for which they have data. These numbers should be viewed in the context of state population and size of professional group (where information is available) and may include some double counting. Training ranges from an hour-long presentation at a conference to a three-hour course for continuing-education credit, to a week-long course resulting in certification by a trade association or state agency.

HUD also provided training to lenders and underwriters responsible for preparing and approving EEMs in the pilot states. HUD routinely trains underwriters on newly issued mortgage letters. In addition, the California

¹⁵DOE-2 is a whole building energy daylighting and simulation program that calculates energy loads, interior temperatures, and interior illuminance from daylight for each hour of the year. The program can be used on multi-zone buildings and uses annual hourly weather data for many locations. DOE-2.1E-W54 was one of three programs that were used to generate the reference results in the BESTEST method. The other two reference programs were BLAST 3.0 Level 215 and SERIRES/SUNCODE 5.7. These three programs are among the most sophisticated for modeling heat transfer in buildings in the United States, and they have been subjected to numerous validation exercises sponsored by DOE and the International Energy Agency.

and Virginia HUD field offices were particularly proactive in reaching out to train lenders and raters on EEMs and the possibilities of incorporating energy-efficient improvements in its 203(k) rehabilitation loans.

These marketing, training, and education efforts absorbed a good deal of HERS program resources and staff time, yet they were essential to achieving market penetration of the HERS/EEMs program.

Technical Assistance and Ratings in Nonpilot States

DOE funded several of the HERS providers to provide technical assistance to other states on how they could establish or make available home energy ratings in their own locales. As of July 1999, home energy ratings were available in 47 states and the District of Columbia through programs including Energy Rated Homes of America and its affiliates, National HERO, Virginia HERO, several independent HERS programs, and a variety of services developed for California. This represents an increase of 30 states since the summer of 1993, before the HERS/EEMs pilot program began (Plympton 2000, Farhar and Eckert 1993).¹⁶

Table 5. Housing Industry Professionals Trained in the HERS/EEMs Pilot States, 1993–1998

Professionals Trained	Alaska	Arkansas	California	Colorado	Mississippi ^a	Vermont ^b	Virginia
Real estate agents	1,475	1,481	5,614 ^c	1,002	197	289	7,038
Lenders	235	505		546	112	278	1,910
Appraisers	122	152	29	206	61	—	73
Builders/contractors	685	195	1,685	72	448	— ^d	605

Source: Data are from the HERS/EEMs pilot states HERS provider organizations.

^a Mississippi also reported 1,518 utility, consumers, and others trained for 1996–1998.

^b Much of Vermont’s training activity occurred prior to 1993.

^c California had 2,650 real estate agents and 450 lenders for 1993–1995 and reported 2,514 lenders and real estate agents for 1996–1998 for a combined total of 5,614 lenders and real estate agents for 1993–1998.

^d Although no data are available, Vermont has an ongoing rating program and had 200 builders/contractors at the Vermont Energy Star Homes Conference.

¹⁶The three states without rating systems available in 1999 were North Dakota, South Dakota, and Wyoming. The 17 states with rating systems in all or part of the state in 1993 were Alaska, Arizona, Arkansas, California, Colorado, Illinois, Indiana, Iowa, Louisiana, Michigan, Mississippi, New Mexico, Rhode Island, Texas, Vermont, Virginia, and West Virginia (Farhar and Eckert 1993).

Funding the Pilot Programs

Sources of Funding for HERS Programs in the HERS/EEMs Pilot States

HERS programs' funding sources vary considerably. In California, for example, utilities provided most of the early CHEERS program funding (from 1993-1995), whereas in Alaska and Colorado, state energy offices were the primary supporters of the HERS programs. DOE supported each of the HERS programs for the duration of the five-year pilot for the original five EEMs pilot states (Alaska, Arkansas, California, Vermont, and Virginia) beginning in FY 1994, and added funding support for Colorado and Mississippi in FY 1996. Other sources of funding include, for example, ratings/dues/sales, National Renewable Energy Laboratory (NREL) (for data base development and evaluation research), and state funds.

The annual budgets for the HERS programs vary considerably by state, from a low of \$133,709 in Arkansas to a high of \$1,235,000 in Colorado for FY 1998. Table A-1 (in Appendix A) presents detailed information.

Prospects of HERS Program Continuation

DOE has been supporting the HERS/EEMs pilot programs for five years, and the funding concluded in FY 1999. The FY 2000 federal budget does not contain funding for further HERS/EEMs pilot state activities. In light of this cessation of federal funding, those pilot programs with diversified funding sources are in a better position to continue their operations than those who are not. Table 6 presents the data on DOE funding as a percentage of HERS/EEMs pilot programs' FY 1998 operating budgets, the most recent data available.

Table 6. DOE Funding as a Percentage of 1998 HERS/EEMs Pilot State Budgets

HERS/EEMs Pilot State HERS Provider	Total 1998 Budget (\$)	DOE Funding as a Percentage of 1998 Budget
Colorado	1,235,000	8
California	1,497,022	16
Energy Rated Homes of Alaska	420,358	40
Vermont	266,944	46
Virginia	362,707	67
Mississippi	182,100	81
Arkansas	133,709	99

Costs of Ratings

It has been found in the pilot states that the charges for the ratings do not cover the costs of providing them. Prices charged for ratings range from a low of \$200 in Colorado to a high of \$350 in Alaska and Vermont (see Table 7). Although data are incomplete, it appears that all of the HERS provider organizations lose money each time they process a rating, ranging from a reported \$5 loss in Mississippi for each rating to a \$565 loss per rating in Virginia. These losses must be made up by other sources of funds, usually DOE funding, to keep the HERS programs solvent.

Table 7. Rating Costs in the HERS/EEMs Pilot States, 1998

Pilot State Providers	Costs to Customers (\$)	Costs of Production (\$)	Difference (\$)
Alaska			
<i>Alaska Housing Finance Corporation</i>	\$250-350	*	*
<i>Energy Rated Homes of Alaska</i>	\$150-250	\$10**	+\$140-240
Arkansas	\$250	\$450	-\$200
California	\$205	*	*
Colorado	± \$200	\$544	- \$344
Mississippi	\$235	\$240	- \$5
Vermont	\$350	\$774	- \$394
Virginia	\$250***	\$615	- \$565

*Data are unavailable.

**Only the ERH-AK program data show each rating as profitable, earning as much as \$240 per rating above cost. However, this result may be a function of the way in which ERH-AK calculated the internal cost of the rating. Other HERS providers—for example, Energy Rated Homes of Colorado—reported all of their administrative costs in delivering the rating program and divided by the number of ratings delivered to derive a dollar cost per rating. ERH-AK only counted a small portion of its budget as a cost of processing ratings. If it had used the same method used by other HERS providers, ERH-AK would have reported the cost per rating as approximately \$663, with the loss per rating at approximately \$463.

***V-HERO receives a \$50 fee from the rater for each rating.

Economic Prosperity

The median household income of the state in which the HERS program operates was identified by some HERS program directors as a barrier to market penetration. Table 8 shows the median household income for the pilot states. The two states with the lowest median household income are Arkansas and Mississippi. HERS programs in these states appear to be having the most difficulty in diversifying their funding sources.

Table 8. Median Household Income by Pilot State

Pilot State	Median Household Income (\$)
Alaska	42,255
Colorado	37,235
California	36,767
Virginia	36,367
Vermont	32,350
Arkansas	26,515
Mississippi	26,501

Source: U.S. Bureau of the Census,
*State Population Estimates and Demographic Components
of Population Change: July 1, 1997 to July 1, 1998*

Program Descriptions

These descriptions of the HERS/EEMs pilot state programs are based on interviews and materials provided by the HERS provider organizations over the course of the evaluation work commenced in 1994 and most recently updated in 1999.

Alaska

Alaska has the oldest statewide HERS program, established in 1984. The AHFC, the ERH-AK, the state energy office, the Alaska Craftsman Home Program, the Alaska Home Builders Association, and Anchorage Municipal Light and Power were instrumental in establishing home energy ratings in the state. Throughout its duration, the Alaska program's focus has been on new construction. Approximately 90% of Alaska's new homes are now being rated. Alaska has enjoyed the support of its home builders for the duration of the HERS/EEMs pilot program.

In 1992, all state energy office housing programs were merged in the AHFC. In 1993, HUD selected Alaska as a pilot state for the FHA EEMs program, in part because of its established HERS program. In 1994, ERH-AK formed as a nonprofit corporation. The HUD/FHA Anchorage Field Office was active in promoting the EEMs pilot program.

In 1996, AHFC and ERH-AK parted contractual company and offered competing HERS programs in Alaska. AHFC contracted with the Alaska Building Science Network to train raters and provide other HERS program services. The AHFC also established an interest rate reduction for energy efficiency for home buyers who obtain an AHFC loan. The amount of reduction increases with the efficiency of the home. A description of the program is included in Appendix C.

Forty percent of new homes in Alaska are financed by AHFC. To obtain an AHFC low-interest loan, a new home must prove compliance with the state's Building Energy Efficiency Standard (BEES). A rating is one of three approved methods to prove compliance and 90% of new housing receives an energy rating. Even if the current buyers do not receive an AHFC loan, future buyers will need the rating documentation should they wish to apply for an AHFC loan. Also, AHFC's interest-rate reductions are additive, so for example, a first-time homebuyer of an energy-efficient home who is also a veteran might receive an interest rate as low as 4.5%.

ERH-AK provides ratings, housing industry education, consumer marketing, and other infrastructure services. The HERS provider also works on issues of national uniformity in ratings, national infrastructure development, technical assistance to other states, national accreditation standards, and development and marketing of home improvement loans (not mortgages or home equity loans) for energy efficiency. ERH-AK's work on national issues has been carried out through ERHA's states and through RESNET, a nationwide network on HERS/EEMs originally conceived in Alaska and supported in its early development in part by the EPA.

ERH-AK has worked to develop the low-interest ERH Loan for home improvements,¹⁷ which it expects to market through all of the ERHA states. ERH-AK plans to expand its loan programs to provide income for the rating program.

The ERH-AK director reports that ERH-AK took the lead in working toward national uniformity. According to ERH-AK, the pilot states have a goal of creating a national HERS industry that would reach a “critical mass” of market penetration nationwide. This includes increasing awareness that ratings are available and that they provide benefits through linking with EEMs. ERH-AK says that the DOE funding for the HERS/EEMs pilot states enabled it to progress toward a national HERS industry.

Successes in national uniformity cited by ERH-AK include the establishment of RESNET accreditation standards and the accreditation of 22 rating organizations using these standards. ERH-AK says that National Association of State Energy Officials (NASEO)/RESNET took the HERS Council technical HERS guidelines, updated them, and recently published them on the RESNET site. These successes are claimed by ERH-AK as, at least in part, a result of the DOE funding of the HERS provider organizations in the pilot states.

Appendix D presents an example of the “rule of thumb” characteristics of a five-star home in new construction in Alaska, as described by the ERH-AK program.

Arkansas

The Arkansas Energy Office (AEO) was instrumental in establishing the ERH-AR in 1986. ERH-AR had close ties with ERHA because the two office were directed by the same individual and were both located in Little Rock. In March 1993, Arkansas legislation charged the AEO with responsibility to develop and implement an EEMs pilot program; in May, HUD/FHA selected Arkansas as one of the original five EEMs pilot states authorized under the 1992 EPACT. In January 1994, the organization was separated from ERHA and a new director was named. A third program director assumed the program’s leadership in 1998.

ERH-AR administers the statewide rating system as a nonprofit HERS provider organization to assist the AEO in its energy education and efficiency programs. The program provides energy ratings and inspections for new and existing homes, blower door tests, and HERS quality assurance. In addition, ERH-AR facilitates EEMs and certifies homes for the EPA’s ENERGY STAR Homes Program and also provides radon test kits. Beyond Arkansas, the program provides services in Oklahoma, Missouri, and Texas.

The rating program was marketed in Little Rock on television spots on Channels 4, 7, and 11 from February 24 through April 2, 1998. ERH-AR also distributes brochures on blower door tests and “Five Easy Steps” and “How to Get the Home You Want”—guides to energy-efficient mortgages. Appendix E presents information from ERH-AR brochures designed for Arkansas residents.

ERH-AR deals with a larger proportion of substandard housing stock than some of the other pilot states, coupled with higher utility bills and lower median income. These housing-market realities make it challenging for the rating program to market its services. Nevertheless, the ERH-AR director believes that HERS/EEMs is a winning program for the state because it creates, at least theoretically, jobs for raters and contractors, sales

¹⁷Eligible improvements are furnaces, boilers, gas conversions, windows, refrigerators, washers, dryers, insulation, roofing, siding, room additions, doors, water heaters, and any energy improvements recommended by an ERH rater.

for builders, larger commissions for real estate professionals, more and larger mortgages for lenders, and lower operating costs for homeowners.

ERH-AR located one lender in NationsBank in St. Louis, Missouri, who has built his success in lending through making EEMs his specialty. This led to more ERH-AR activity in Missouri.

The ERH-AR program director believes the program has been seriously underfunded, and indeed, its 1998 budget, \$133,709, was the lowest of the seven pilot states. This funding level was approximately 10% of the California and Colorado budgets for 1998. The HERS program relied almost exclusively on DOE funding to sustain itself.

The ERH-AR changed management direction in 1998 from a program that relied almost completely on federal funding to one that now emphasizes self-sufficiency. Although 1998 was a relatively late start on the pilot program's new goal, the program director believes ERH-AR has accomplished a great deal considering its funding constraints.

California

In the mid-1980s, the California Energy Commission (CEC) began testing HERS in the state. In 1990, Pacific Gas and Electric (PG&E) requested the CEC's support and participation in establishing a statewide HERS program. CHERS, Inc., a consortium of gas and electric utilities, was established that year, and through its auspices, CHEERS—the software used for ratings in California—was completed.

Appendix F exhibits excerpts from a CHEERS program brochure advertising benefits of a home energy rating such as decreased utility bills, increased value of the home, and helping to preserve the environment.

In September 1992, California legislation was passed requiring the CEC to develop criteria for a statewide HERS program. The CEC provided training and education for real estate professionals, lenders, and appraisers on the 2% stretch loan and on benefits of EEMs. The CEC also worked through the Building Industry Institute (BII) to review HERS guideline and train the state's home builders on EEMs. The BII contract is managed by ConSol, Inc.

With utility restructuring on the horizon, PG&E, which had been the CHEERS program's main supporter, markedly reduced its funding in 1996. The program's funding has been augmented by the fees charged for ratings, other utility funding, the CEC, and DOE.

California now has competition among HERS providers—seven organizations perform ratings, including CHEERS; Consumer Energy Management Consulting; ConSol, Inc.; EEMs, Inc.; Federal Energy Services; H&L Energy Savers; and Rated Energy Plus. The CEC wants to use Title 24, which is a performance building code, to improve housing efficiency (see below). The CEC is currently working with the building industry and other interested parties to develop a performance-based HERS that is compatible with both Title 24 and national guidelines. ConSol, Inc., currently providing HERS ratings for new homes in California and Nevada, believes that the real value in the rating is access to financing and that rating can work with Title 24.

Title 24

California's Title 24 is a performance code based on a systems analysis of a home's projected energy use (space and water heating, and space cooling). Title 24 results in a pass/fail decision on a building permit application. California has been divided into 16 climate zones by the CEC; for each climate zone, Title 24 identifies a set of prescriptive requirements for insulation, water heating, windows, furnace, air conditioning, glazing, and shading. Using a software program called MICROPAS, for instance, builders can use a computer performance approach to demonstrate that their designs use no more energy than they would if built with the prescriptive features. Builders' energy consultants typically prepare "paper" (but not computer-generated) documentation for Title 24 compliance for proposed homes, which is then reviewed by building officials. A difficulty in actually achieving efficiency lies in the differences between the features claimed in the systems analysis calculations and the actual features installed.

Starting July 1999, Title 24 provides optional credit for tight ducts and low air infiltration. These credits, which builders can trade for other features such as increased window area, require blower door and duct blaster tests. For the builder to use the credit, the installer must test and certify each home and an independent, third-party rater must randomly check the subdivision's homes.

HERS

HERS can improve the quality of construction. The HERS rating system being used in California for new homes by ConSol and by other CHEERS raters, is based on the MICROPAS software that can also be used to demonstrate compliance with the Title 24 energy efficiency standards. This provides a potential link between Title 24 and HERS.

CHEERS currently receives plan submittals from the analyst, which it stores for later verification. After the home has been constructed, the CHEERS field rater sends verification of the energy features to CHEERS. After CHEERS receives the inspection data, it sends the rating certificate, which includes the lot number and address, to the rater. CHEERS provides training, oversight, and quality assurance for diagnostics and ratings. CHEERS has been approved by the CEC as a HERS provider and can certify raters. (Prior to July 1999, raters were not certified in California.) After July 1999, uncertified raters are not allowed to perform diagnostics for Title 24 credit in California. In the future, certification will also be required for all ratings. A proceeding began in July 1999 to define the technical and computer modeling requirements for HERS in California.

Title 24 and HERS

In recent DOE-funded training in the state, it was found that 75% of the documents for Title 24 compliance were incorrect. The typical home is 7% less efficient than the Title 24 code requires. BII encouraged builders to train their personnel and have third-party inspections as a means to improve compliance with Title 24. In addition, ConSol believes there should be a heating, ventilating, and air-conditioning design and layout, an initial inspection during the rough frame, and a second inspection at the end of construction to ensure that energy efficiency features are installed properly and will result in a comfortable and efficient home. ConSol believes that if amenities are equal, home buyers will choose a more efficient house as certified by a home energy rating. But without standardized ratings, customers are unable to differentiate among the home rating, brand, and options packages.

Market Value of HERS

HERS can improve the quality of construction. If builders can reduce their litigation exposure because their homes are comfortable, they can invest the savings in improved housing quality. The most frequent complaint in litigation is water intrusion; the second most frequent complaint is that home buyers cannot get warm or cool enough. Energy-related quality improvements are embodied in increased comfort, which can also increase customer referrals to the builder. The market value for a system using ratings might be captured through reduced numbers of callbacks and reduced litigation for builders. The market value of HERS may also be demonstrated if home buyers recognize energy efficiency in their home purchase decisions.

EEMs

Large production builders negotiate with lenders for mortgage interest rates, fee structure, and promotional advantages, so EEMs have no effect on the mortgages for production homes. However, EEMs could be useful because current lending processes do not take energy bills into account. According to ConSol, the latest Freddie Mac EEMs guidelines require a rating; they do not require an appraiser form 70A (as was previously the case). Norwest Bank, which provides EEMs in California, analyzed how a rating would change borrower qualifications using a sample five-star rating that indicated a \$26/month net savings. Norwest found that \$26 was about a 1% stretch for mortgages under a \$150,000 sales price; the loan would be approximately \$135,000. Norwest would either credit the utility savings on the debt-to-income ratio or allow the home buyer to purchase \$26/month more amenities for the home. To benefit their business, lenders want builders to qualify more buyers or sell amenities options packages for larger loans.

Future Directions

The Title 24 code is evolving toward a performance code backed up by independent, on-site inspections. In ConSol's opinion, to maintain the integrity of the Title 24 system, a third party—a home energy rater—is needed to test a random sample of the completed homes for production builders. The installer certifies the installation of energy features. The CEC has recently approved rules for HERS providers and the testing procedures. The computer modeling system for HERS is under development.

Colorado

Energy Rated Homes of Colorado (ERHC), established in 1995 as part of the ERHA network, has recently experienced a change in program directors. The new director came from the Colorado Housing Finance Agency, the organization within which the ERHC program currently resides. The Colorado HERS program (called "E-Star Colorado") was one of the more generously funded HERS programs in the nation, with a budget above \$1.2 million both in 1997 and in 1998.

ERHC trains, certifies, and maintains a statewide rater pool. It processes ratings for both existing homes and new construction, maintaining quality control of ratings. A major program achievement has been the recent development of the new RMS using a version of DOE-2 to produce ratings and to manage the flow of ratings from the simulation engine to printing. RMS includes a management tool that tracks rater certification and other administrative matters, such as education credits. Raters can enter rating data directly online. The program allows for central processing of a large volume of rating and storage of output data in a central database. ERHC will be able to sublicense the software, which can be used in all climate regimes nationwide. The use of RMS should result in substantially reduced overhead costs for performing each rating.

ERHC has found, based on anecdotal information, that homeowners receiving ratings may not use them to obtain mortgages for energy improvements, but often use ratings for information purposes. Energy improvements may be made through regular home equity loans or without financing at all.

Barriers to the program include low utility rates, low interest rates for home mortgages, and lack of consumer awareness. ERHC's strategy from the outset has been to work closely with the Home Builders Association through a green-builders training course and by offering builders a free home rating analysis of a home the builder is constructing. This has been successful in the custom building market. Builders like to market E-Star™ Homes as environmentally friendly. The program has also worked successfully with utility companies and real estate professionals to market ratings. The program now has a high volume of ratings. Between 1995 and 1998, ERHC did 3,812 ratings, although this is a small percentage of the housing stock. Half of the ratings are done in new construction and half in existing homes.

Raters need to charge about \$250 per rating to make the visit financially feasible. They currently charge customers \$150 for each rating. ERHC provides raters with a \$100 subsidy for each rating. The true cost of each rating to ERHC, including program administration and marketing, has been approximately \$650 to \$700.

Appendix G presents information from ERHC brochures advertising how an E-Star™ certified home can increase a homeowner's home-buying power.

ERHC plans to diversify its revenue sources by charging raters an annual certification fee of \$50 and charging builders registration fees for becoming E-Star™ builders.

Mississippi

The Energy Rated Homes of Mississippi (ERHM) program was organized under the initiative of the Mississippi Energy Office in 1994 to provide home energy ratings and promote energy-efficient mortgages as a market-based, fuel-neutral activity as stipulated in EPA ACT. ERHM formed as a nonprofit organization with a board of directors representing the interest of the housing industry, utility companies, and consumer education groups. The program is staffed by an executive director, administrative assistant, rating director, and rating processor. The program has certified six independent home energy raters in Mississippi and 11 in four additional states.

ERHM has identified three markets that it wants to emphasize: (1) buyers of existing homes using an energy improvement mortgage, (2) buyers of new homes using an energy-efficient mortgage and EPA ENERGY STAR Home promotions, and (3) permanent homeowners wanting to improve the energy efficiency of their homes. ERHM has moved toward diversifying services, increasing its emphasis on building codes and energy codes, and working with builders and contractors on energy efficiency.

With limited consumer advertising dollars, ERHM has concentrated training and presentation efforts on builders, lenders, real estate professionals, and other organizations. A continuing education course has been designed for real estate professionals and appraisers. The organization has also worked to get utility companies to co-sponsor events and advertising in conjunction with their homes.

ERHM contacts builders to explain how the Fannie Mae/Freddie Mac mortgage pilot program can benefit them. With a rating, builders can add value to their homes based on efficiency levels that are above those achieved by standard construction practice. Until 1998, Mississippi borrowers had no access to national mortgage lenders that were offering ENERGY STAR Mortgages. GMAC Mortgage Corporation, which

located in the state in 1998, formed a partnership with ERHM to promote energy efficiency by financing four-star and five-star homes.

Mississippi has no enforced statewide building code nor a model energy code. The absence of both of these codes impedes progress toward high standards of energy efficiency in the state's housing. In typical construction in Mississippi, no one knows who is responsible for the holes that are created for plumbing and electrical access; therefore, no one takes responsibility for sealing these holes. However, ERHM is identifying contractors who know the benefits of "airtight" practices and the program has worked with them to create an "Energy Check" program for certified energy contractors.

In Mississippi, consumers remain unaware of energy efficiency and its benefits, and no enforced disclosure is made concerning utility bills at the time of home sale. Moreover, Mississippi has the lowest per capita income in the nation with high need for affordable and efficient housing. Although the potential is great, the barriers are also significant.

ERHM has worked with other ERHA pilot programs to establish national uniformity of the rating system and a national accreditation to further the recognition of HERS with builders and lenders. Additionally, ERHM has received accreditation in Alabama, Georgia, North Carolina, and South Carolina to initiate HERS activities there. Accreditation is pending in Tennessee.

ERHM has developed a regional HERS program called Energy Rated Homes (ERH) of the South. ERH of the South, through its contractual partner, Southface Energy Institute in Atlanta, has trained raters in other states for a \$350 fee, has certified raters for an annual sublicense fee of \$120 (including of sublicense REMRate to raters), and has collected a \$50 fee per rating for recordkeeping and to pay for REMRate. ERHM believes that ERH of the South will be able to sustain itself through fees collected.

ERHM has striven for high standards of professional conduct throughout its history. Appendix H presents the Code of Ethics used by the ERHM program and its raters.

Vermont

HERS/EEMs activities began in 1986 with state allocation of petroleum violation escrow (PVE) funds to the Vermont Department of Public Service to develop a program to finance energy improvements in housing. The Vermont Housing Finance Agency (VHFA) took the program lead. In 1987, ERH-VT was incorporated as a nonprofit to provide ratings and was housed in the VHFA offices. In 1993, HUD/FHA chose Vermont as an EEMs pilot state. ERH-VT was also a Fannie Mae pilot state and the program partnered with utilities to include builder incentives for energy efficiency construction. From 1994 to June 1999, ratings were being incorporated into utility demand-side management programs.

The Vermont Energy Investment Corporation (VEIC), incorporated in 1986, became the organizational home for ERH-VT in 1996. ERH-VT is currently a project within VEIC. This organizational arrangement fosters diversification of services, and assists ERH-VT in becoming more self-sufficient.

The ERH-VT program director, believing that ratings need to be part of a larger strategy, has diversified the services the program provides. By the end of 1998, ERH-VT was involved in the following activities:

- Home energy ratings for new and existing home programs
- Ratings for use in determining compliance with gas and electric utility new construction programs
- Yearly Energy Savings System (YESS) mortgage program with VHFA, including a reduced interest rate energy improvement mortgage for buyers of existing homes¹⁸ (Details are in Appendix I.)
- Vermont Energy Mortgage Pilot Program through Fannie Mae and Freddie Mac allowing for the 2% stretch
- FHA and U.S. Department of Veterans Affairs EEMs
- New construction five-star ratings for ENERGY STAR Homes
- Ratings and contract management services subsidized by various Vermont utilities to facilitate financing of new energy systems through energy improvement mortgages (EIMs)
- Complete turnkey Energy Improvement Mortgage Services (including facilitation and contract management) for home buyers
- Ratings to determine compliance of new buildings with the Vermont Residential Energy Code.

The Vermont program has focused primarily on new construction. Barriers remain to use of ratings on existing homes, including the reluctance of housing professionals to incorporate EEMs, regarded as an additional “hassle,” into their daily practice. ERH-VT is working to overcome these barriers through its Energy Improvement Mortgage Service, which provides such services as initial borrower consultation, lender assistance and personalized training, and completion of all lender forms to access an EIM. The program director believes that lenders will respond to this service.

As in other states, in Vermont the cost of performing a rating is higher than what the market will pay. In Vermont, the VHFA offers a reduced interest rate mortgage called YESS, which rolls costs of energy improvements into the mortgage. Borrowers can also use the 2% stretch or FHA and DVA EEMs, although the 2% stretch loan is perceived as ineffective as long as the borrower has a good credit history because lenders have the discretion to stretch debt-to-income ratios.

Vermont’s Multiple Listing Service now includes rating information on homes in its data sheets; appraisers are being trained in the role of energy ratings’ impacts on home value. The program director believes, based on anecdotal information, that a four-star home is worth \$1,000 more than a three-star home. Also, the Vermont energy code includes ERH-VT as one of the code compliance options for builders.

ERH-VT has worked closely with ERHA and NASEO/RESNET to build the HERS industry. ERH-VT was accredited by the NASEO/RESNET mortgage industry accreditation committee. The HERS program has used

¹⁸The rate changes periodically as funds are used up; the most recent rate was 5.2%.

its political connections to foster national legislation and appropriations for continued HERS industry support. ERH-VT created the Northeast HERS Alliance to focus on ENERGY STAR Homes and on existing home energy improvement financing in New England and New York. This Alliance provides technical and marketing assistance on HERS/EEMs to other states in the region while working to develop accreditation procedures for HERS providers.

To ensure its future self-sufficiency, ERH-VT has to collect fees for technical assistance on HERS/EEMs to other states and must charge full fees for ratings and its turnkey service. The HERS program could also be supported, in part, by income from its YESS loan program.

Virginia

In 1989, the Virginia Commonwealth Department of Mines, Minerals, and Energy worked with ERHA to develop a rating program for Virginia. The Commonwealth funded the start-up HERS program for two years using PVE funds. By February 1993, the V-HERO was established as a nonprofit organization to train and certify raters, perform ratings, and administer the rating program. In May 1993, HUD/FHA selected Virginia as an EEMs pilot state. Dissatisfied with ERHA's products and services, V-HERO separated itself and developed its own training, marketing, and software products for rating. DOE funding for Virginia's HERS/EEMs program began in 1995.

Also in 1995, N-HERO was established as a Virginia corporation. N-HERO's purpose is to make it economically feasible to develop HERS services in other states without duplicating in-state programs with inherent costs in every state. N-HERO provides management and other services for the V-HERO program under a management contract and works to expand a rating system nationally in competition with ERHA and others. The V-HERO program director also served as a board member of the national HERS Council since its inception, and chaired the board for two years. The Commonwealth's support for the program is documented in a Virginia joint legislative resolution commending the program (see Appendix J).

V-HERO relies on the HERS Council's technical guidelines for ratings. V-HERO funded development of RateView, a rating software tool to replace ERHA's EZ-Rater program, which V-HERO stopped using when it withdrew from the ERHA program. V-HERO performs quality control for each rating checklist submitted by raters, performs the ratings, and produces a rating report designed for use by lenders. The program also ensures that conflicts of interest are avoided (such as raters acting as contractors for the retrofits recommended in the ratings and a different rater performing the post-improvement inspection).

The V-HERO board analyzed the costs of performing ratings; their study found that ratings cost far more to provide than homeowners are willing to pay. The board recommended that V-HERO diversify its services and increase volume of ratings to bring down cost per rating. This caused V-HERO to emphasize self-sufficiency as a program goal. A significant rationale for N-HERO's formation was to provide profit-producing services in the marketplace to offset the cost of providing rating services. Profits from N-HERO were intended to be used to support V-HERO if federal funding for the HERS program is not renewed.

V-HERO has heavily emphasized marketing to the general public through media and used television advertising more extensively than other HERS/EEMs pilot programs. However, the V-HERO program says it needs more resources for marketing or needs a federal nationwide marketing program. V-HERO also established a financial incentive contest for lenders in the Commonwealth, offering \$2,000 to the lender who produces the highest number of EEMs. The program also forged linkages with other HERS/EEMs infrastructure members (such as appraisers, HUD/FHA staff, home builders, and real estate professionals).

V-HERO claims to have rated and improved more than 18,000 homes, resulting in 30% to 60% reductions in energy use with concomitant greenhouse gas emissions reductions. The HERS program has trained and certified 125 raters. The V-HERO program assists the Virginia Environmental Protection Agency in reaching compliance for emissions abatement and clean air standards. In addition, V-HERO has long been concerned with housing affordability and assists in bringing quality improvements to inner-city construction along with cost savings of almost half on utility bills.

Future Actions and Needs: Views of the Pilot State HERS Providers

The pilot state HERS providers expressed their views of the role that the federal government should play in the future relative to the development of a national system of EEMs linked with HERS. Each organization says it is unlikely to or will not survive without federal funding. Some of the ERHA members want funding to come to them via ERHA. Even HERS providers with diversified funding sources express a need for federal funding.¹⁹

Consumer demand for and willingness to pay for ratings is not high enough in the pilot states to support a HERS industry. Also, the cost of delivering ratings is higher than the fees charged for ratings, resulting in a net loss to the HERS programs for each rating performed.

In addition to federal funding, the HERS provider organizations themselves suggest several federal actions they believe are necessary to maintain the HERS industry. Three major themes emerge from their discussions on this point. In addition to continued federal funding of the pilot HERS provider organizations, the HERS providers define the need for a federal role as follows.

- Federal energy efficiency tax credits
- Federally mandated use of HERS for EPA's ENERGY STAR Homes program
- A federally supported marketing and public information campaign.

Use of HERS for Energy Efficiency Tax Credits

The HERS providers support a tax credit for energy-efficiency improvements in housing. They call for requiring a HERS rating for taxpayers' energy improvements in housing to ensure efficacy and to qualify for the tax credit.

Use of HERS for EPA's ENERGY STAR Homes Program

HERS providers believe EPA should require home energy ratings for each house labeled as an ENERGY STAR Home, thus helping to assure markets for their services. Until recently, EPA has required that its ENERGY STAR Homes label be used only on new homes that had been rated as 86 or higher on the home energy rating scale. Builders have expressed concern about the cost of providing ratings for each new home. In response, EPA has developed a set of builder option packages (BOPs) that builders can use to obtain ENERGY STAR certification. These BOPs comprise a checklist of energy improvements EPA believes would bring the home to the equivalent of an 86 rating, representing a prescriptive approach to home energy rating and labeling, rather than the performance-based approach adopted by the National HERS/EEMs Collaborative in 1992 and legislated in the Energy Policy Act of 1992. However, HERS providers believe that EPA should continue to require home energy ratings for each house labeled as an ENERGY STAR Home to ensure that the house meets efficiency standards (Plympton 2000).

¹⁹ The Virginia Home Energy Rating Organization said that no further federal funding should come to the HERS/EEMs pilot states at the end of the five-year pilot program.

Federally Supported Energy Efficiency Marketing Campaign

HERS program directors suggest that a federal program to advertise HERS/EEMs and to educate customers about the benefits of home energy ratings and energy-efficient mortgages—as well as about energy efficiency generally—would help increase demand for their services. Although one HERS provider disagrees, increased demand could potentially help them become more self-sufficient by reducing rating cost through increased volume. Several of the HERS program directors note they have insufficient funds to adequately advertise their programs and educate homeowners and home buyers in order to increase demand for their services. Program directors find that customer demand increases with the level and type of advertising. Television spots, for example, appear to stimulate many customer calls. But educating the public and advertising the programs enough to further stimulate the markets is beyond the budgetary resources of the HERS provider organizations.

Discussion

The HERS providers in the pilot states were funded by DOE to provide technical assistance on HERS program development to states without HERS programs. Their efforts have been, in part, realized. In 1993—before the pilots began—rating services were available in all or parts of 17 states (Farhar and Eckert 1993). By 1999, that number had increased to 47 states and the District of Columbia. Regional HERS are in development in the Northeast, Midwest, and South. Nationwide, approximately 500 trained and certified raters are employed full- or part-time.

Factors Appearing to Affect Program Operations

Several factors appear to affect HERS program operations. Although each HERS/EEMs pilot program offers a unique story, there may be some common themes. The evaluation research has yielded observations on the following themes:

- High levels of funding over relatively short time periods
- State-funded financial incentives for energy efficiency financing for mortgage borrowers
- Financial incentive for lenders to market EEMs
- Diversification of services
- Continuity in HERS program leadership
- Active involvement of key stakeholders.

Table 9 summarizes the positions of the HERS programs on these factors.

High Levels of Funding

HERS programs in Alaska, California, and Colorado each received high levels of funding during short periods of time (\$8.5 million in FY 1993–FY 1995 in Alaska; \$3.2 million in California in FY 1993–FY 1995 as well as annual funding exceeding \$1 million; and \$2.5 million in Colorado in FY 1997–FY 1998). These funding “spurts” undoubtedly assisted the HERS programs.

State-funded Financial Incentives for Energy Efficiency Financing for Mortgage Borrowers

A slight interest rate break for EEMs (on the order of a quarter-point mortgage interest rate reduction) could make them more attractive to borrowers (although the incentive to lenders of offering an interest rate break is unclear). The Alaska Housing Finance Corporation offers such an interest rate break, with 1,151 loans being completed in 1998. (In contrast, only 32 EEMs were completed in Alaska in 1998.) The new YESS program in Vermont also offers an interest rate reduction to energy-efficient mortgage borrowers.

Financial Incentives for Lenders to Market EEMs

V-HERO offered a \$2,000 recognition award for the lender completing the highest number of EEMs in Virginia in 1998; 375 EEMs—a relatively high number—were completed in Virginia using ratings from the V-HERO program that year. This observation suggests that aggressive marketing of EEMs by the mortgage community may be important to increasing the number of EEMs achieved, and that a financial incentive for lenders could increase lender marketing efforts.

Table 9. Observations on HERS/EEMs Pilot Programs

HERS/EEMs Programs	High Levels of Funding	State-Funded Financial Incentives for EEMs	Financial Incentives for Lenders	Diversification of Services	Continuity in Program Leadership	State Population
Alaska <i>AHFC</i> <i>ERH-AK</i>	High	<i>High</i> <i>High</i>	None	<i>Yes</i> <i>Yes</i>	<i>Missing data</i> <i>Yes</i>	Low
Arkansas	Low	None	None	Yes	No	Medium
California	High	None	None	Yes	No	Very high
Colorado	High	Very low	None	Yes	No	Medium
Mississippi	Low	None	None	Yes	Yes	Medium
Vermont	Medium	High	None	Yes	Yes	Low
Virginia	Medium	None	In one year	Yes	Yes	Medium

Diversification of Services

Vermont’s program has been incorporated into a larger entity (a nonprofit organization) and offers a suite of services, including home energy ratings, a turnkey service for lenders, code compliance documentation, and appraiser training. The Virginia program offers several services, including consulting on inner-city housing affordability, development of innovative energy-efficiency financing products, and financial incentives for lenders. Mississippi’s program also offers several services, including “EnergyCheck,” a checklist of viable energy efficiency options for the homeowner. Organizations that combine their home energy rating services with other energy efficiency, housing, and mortgage lending services may increase the probability of their viability without federal funding. Packaging services appears to have three aspects: (1) diversification of services to add value that the market recognizes and is willing to pay for, (2) sharing of administrative costs so that the incremental cost of each rating processed is reduced, and (3) reducing per-unit rating cost through working with large production builders to increase their quality assurance. Such diversification may help HERS programs to survive without continued federal funding.

Continuity in HERS Program Leadership

Continuity in program leadership, combined with experienced HERS program leaders, appears to be another key factor in sustained operation. Alaska, Vermont, and Virginia had the same managers for the duration of the five-year pilot program, which appears to have strengthened each of these programs. The remaining pilot states have experienced major shifts in leadership, which could have cost them some momentum.

Active Stakeholder Involvement

The extent of stakeholder involvement appears to be another factor. The two least-populated states appear to have completed, proportionally, the most ratings. This may be, at least in part, a function of a smaller state's greater opportunities for interaction among the prominent stakeholders in the energy, building, housing finance, lending, real estate, appraisal, government, and rating-provider communities. The active participation of key stakeholders appears to enhance a program's effectiveness in completing ratings. Such participation may take longer in more populous states.

Other Observations

Economic prosperity, as measured by a state's median income, does not appear to be strongly associated with the number of ratings completed. Ranked in order by median income, the HERS/EEMs pilot states are (see also Table 8):

- | | |
|----------------------|---------------------|
| 1. Alaska—High | 5. Vermont—Medium |
| 2. Colorado—Medium | 6. Arkansas—Low |
| 3. California—Medium | 7. Mississippi—Low. |
| 4. Virginia—Medium | |

Housing markets are booming in several of the pilot states, notably in California and Colorado. In these circumstances, mortgage lenders are already so busy that they do not seem to need to differentiate themselves by offering EEMs, which is a special service requiring more effort on their part. Demand for HERS/EEMs may be dampened in times of housing boom, which appears to militate against a positive effect for HERS/EEMs because of a state's higher economic prosperity. On the other hand, Alaska, with relatively high economic prosperity, used state funds and rating fees to fund its AHFC program, resulting in more ratings.

EEM program advocates on the HUD field office staff, especially in California and Virginia, had a positive impact on HERS/EEMs operations—proactively reaching out to lenders, real estate professionals, HERS provider organizations, and consumers.

Recommendations for HERS Programs

Based on the data collected from the HERS/EEMs pilot program providers and the observations emerging from the program evaluation, the following recommendations appear to offer the best possibilities for HERS programs to continue without federal subsidies.²⁰

- Ratings are routinely used as an integral part of EPA's ENERGY STAR Homes Program to qualify houses for an ENERGY STAR label.
- HERS programs integrate themselves with agencies or other organizational entities (nonprofit or for-profit) to help reduce administrative costs.
- HERS programs evolve into one part of a package of services for which the market is willing to pay.

²⁰ The pilot state HERS provider organizations might not completely agree with all of the items listed.

- HERS programs work with large production builders on quality assurance to reduce transaction costs per rating provided.
- HERS programs partner with financial institutions to offer loans to pay for recommended energy improvements, and use the income generated to help support the rating program.

Recommendations for Future Research and Analysis

Even though the HERS/EEMs pilot states program has been completed, significant questions remain about the financing of energy-efficient new housing and of energy efficiency improvements in existing housing. For example, no data exist on the energy conservation measures that have been installed through the program. In addition, no data currently exist on the amounts actually loaned for energy efficiency improvements—that is, the percentages of the total EEMs made that was used to pay for energy features. This sort of information would be helpful in increasing understanding about the market for types of energy efficiency improvements and, therefore, the marketing of EEMs products.

Peer-reviewed analysis on the impact of EEMs on mortgage loan performance is still lacking. This critical question has been identified as the core issue by the mortgage community in its design and use of EEMs products. Analysis will depend, in part, on the availability of accurate data in the databases of the federal government and the secondary mortgage markets. The lack of data has prevented this question from being addressed. Until the question of default has been credibly addressed, the mortgage community may remain hesitant to aggressively market EEMs.

Recommendations for consumer education about the need for and benefits of energy efficiency are frequently made. Although consumer education is undoubtedly necessary to support the demand for energy-efficient homes and energy improvements in existing housing, it is not sufficient to bring about significant changes in the marketplace. Energy-efficient housing must be credibly labeled. Research is needed to ascertain the most useful form of and mechanism for energy efficiency labeling for housing—both new and existing—so that potential buyers, lenders, real estate professionals, and appraisers can rely on the energy information presented.

Finally, the actual impact of EEMs-financed homes on energy cost savings should be analyzed to determine the energy and cost savings, as well as positive environmental effects, as a result of the programs.

Conclusions

There have been major advances in HERS and EEMs since the passage of EPACT in 1992. In part because of HERS pilot state activity, home energy ratings are now available in 47 states and the District of Columbia and EEMs are offered nationwide by several national lenders. Rating software has improved technically during the pilot test. Many states have benefited from the regional approach taken by several of the pilot states. Of the 43 nonpilot states, 30 states report agreements with HERS programs in other states and 17 report having active HERS programs in place. Accomplishments during the five years of the pilot program include completion of more than 63,000 home energy ratings and of 8,534 EEMs worth a total of more than \$902 million.

The HERS programs that have resulted in the most HERS/EEMs activity are those that have:

- Obtained high levels of funding from several sources over relatively short time periods
- Offered state-funded financial incentives for energy efficiency financing for mortgage borrowers
- Offered financial incentives for lenders to market EEMs
- Operated within a larger entity and offer other energy services along with ratings
- Maintained continuity in HERS program leadership
- Actively involved key stakeholders in housing finance, ratings, real estate, building, government, and related communities.

These strategies appear to help HERS programs to become more financially self-sufficient. The best prospects for self-sufficiency appear to involve locating the programs within another organization and diversifying energy efficiency services. States may opt to fund HERS programs to keep them operational.

Improved market demand would assist HERS programs. Although there is some EEMs activity in the pilot states, the mortgage community has not fully embraced HERS/EEMs. The 2% debt-to-income ratio stretch offered by the conventional mortgage markets—which existed prior to the HERS/EEMs pilots—is, by itself, inadequate to increase market demand for HERS/EEMs. If a 2% ratio stretch were added to the ratio stretch already within discretion of mortgage lenders, more incentive might exist. Interest rate reductions for EEMs could also increase demand, although the rationale for such reductions has not been established by the mortgage community. Increased mortgage community commitment to and marketing of EEMs would enhance the prospects of HERS programs.

After five years and \$4.2 million in federal funding overall, it appears that most of the HERS programs in the pilot states will find it difficult to remain operational without outside support. The situation for the HERS programs is made more difficult by the fact that each rating they process actually costs them more resources than it brings in. However, by diversifying services, increasing volume while decreasing rating costs, reducing transaction costs, reducing administrative costs, and charging fees for service, the programs may be able to continue offering ratings well into the future.

Glossary

AEO	Arkansas Energy Office
AHFC	Alaska Housing Finance Corporation
BEES	Building Energy Efficiency Standards
BESTEST	Building Energy Simulation Test
CEC	California Energy Commission
CHEERS	California Home Energy Efficiency Rating System
CHFA	Colorado Housing Finance Agency
CHUMS	Computerized Housing Underwriting Management System
CY	calendar year
DOE	U.S. Department of Energy
DVA	U.S. Department of Veterans Affairs
EEMs	energy-efficient mortgages
EIM	energy improvement mortgage
EPA	U.S. Environmental Protection Agency
EPACT	Energy Policy Act of 1992
ERHA	Energy Rated Homes of America
ERH-AK	Energy Rated Homes of Alaska
ERH-AR	Energy Rated Homes of Arkansas
ERHC	Energy Rated Homes of Colorado
ERHM	Energy Rated Homes of Mississippi
ERH-VT	Energy Rated Homes of Vermont
EWG	Evaluation Working Group
FHA	Federal Housing Administration
FY	fiscal year
HERS	Home Energy Rating Systems
HUD	U.S. Department of Housing and Urban Development
NASEO	National Association of State Energy Officials
N-HERO	National Home Energy Resources Organization
NREL	National Renewable Energy Laboratory
OEC	Colorado Office of Energy Conservation
PG&E	Pacific Gas and Electric Company
PVE	Petroleum Violation Escrow Funds
PWG	Pilot States Working Group
RESNET	Residential Energy Service Network
RHS	Rural Housing Service, U.S. Department of Agriculture
RMS	Rating Management Software
USDA	U.S. Department of Agriculture
V-HERO	Virginia Home Energy Rating Organization
VEIC	Vermont Energy Investment Corporation
VHFA	Vermont Housing Finance Agency
YESS	Yearly Energy Savings System Mortgage Program (Vermont)

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Appendix A. Tables

Table A-1. Funding for Portions of Rating Activities in the HERS/EEMs Pilot States, 1993–1998

		Funding Source (\$)								
Pilot State	Calendar Year	State Energy Office	Utilities	DOE ^a	NREL	Ratings/ Dues/ Sales	State-level Funds	In-house	Other	Totals (\$)
Alaska ^{b,n}	1993–1995	1,800,000	—	135,000	10,000	550,000	6,000,000 ^c	—	—	8,495,000
	1996	—	—	120,785	—	—	—	80,000 ^d	56,000 ^e	256,785
	1997	—	—	193,500	—	—	—	105,000	110,000	408,500
	1998	—	—	170,358	—	—	—	110,000	140,000	420,358
Arkansas ^f	1993–1995	170,500	—	130,000	10,000	—	—	—	68,300	378,800
	1996	0	31,000	91,709	—	2,730	0	16,896	789	143,124
	1997	0	3,900	148,291	—	3,625	0	0	9,717	165,533
	1998	0	0	132,315	—	5,548	0	0	840	133,709
California ^g	1993–1995	200,000	1,742,900	260,000 ^h	10,000	388,600	200,000	165,000	228,000	3,194,500
	1996	114,525	500,000	232,625	—	377,580 ⁱ	—	—	—	1,224,730
	1997	—	400,000	318,000	—	494,583	—	—	—	1,212,583
	1998	—	300,000	238,852	—	958,170	—	—	—	1,497,022
Colorado ^j	1993–1995	418,000	44,000	0	—	4,000	0	—	—	466,000
	1996	593,000	82,000	197,000	—	18,000	0	—	—	890,000
	1997	1,048,000	90,000	95,000	—	36,000	0	—	—	1,269,000
	1998	1,000,000	80,000	100,000	—	55,000	0	—	—	1,235,000
Mississippi ^k	1993–1995	—	—	—	—	—	—	—	—	—
	1996	74,624	—	28,001	—	3,544	—	—	9,932	116,101
	1997	—	—	124,631	—	3,603	—	—	156	128,390
	1998	31,333	—	146,951	—	2,587	—	—	1,229	182,100

Table A-1. Funding for Portions of Rating Activities in the HERS/EEMs Pilot States, 1993–1998 (cont'd.)

Pilot State	Calendar Year	Funding Source (\$)								
		State Energy Office	Utilities	DOE ^a	NREL	Ratings/ Dues/ Sales	State-level Funds	In-house	Other	Pilot State
Vermont ^l	1993–1995	34,250	—	130,000	10,000	344,300	120,000	30,900	13,700	683,150
	1996	10,000	0	117,750	—	110,998	0	41,796	34,219	314,763
	1997	0	0	116,661	—	159,264	0	37,619	5,299	318,843
	1998	0	0	123,426	—	83,141	0	38,492	21,885	266,944
Virginia ^m	1993–1995	225,000	100,000	190,000	10,000	45,000	70,000	—	100,000	740,000
	1996	—	32,500	139,591	4,493	7,000	—	—	—	183,584
	1997	—	—	206,635	500	7,362	—	—	—	214,497
	1998	—	—	227,831	0	8,365	—	10,444	116,067 ⁿ	362,564

Source: Data are from the cognizant organization as noted, including the HERS/EEMs pilot state HERS provider organizations.

^a The DOE funding for the pilot states is shown in Table A-1 as FY 1993–1995 funding; however, the pilot state HERS provider organizations did not actually receive any DOE funds until the spring of 1995. Therefore, the figures shown represent awards to the HERS provider organizations, not their operating budgets.

^b Includes Alaska Housing Finance Corporation, Energy Rated Homes of Alaska Program, Energy Rated Homes of Alaska, Inc., and Alaska Craftsman Home Program, Inc.

^c Alaska Housing Finance Corporation rebates and loans linked to ratings

^d Funding from Alaska Housing Finance Corporation in-house budget, 1996-1998

^e Alaska other funding sources include \$40,000 per year from industry in-kind funding

^f Energy Rated Homes of Arkansas only

^g California Home Energy Efficiency Rating System, Inc. (CHEERS) and California Energy Commission (CEC)

^h \$170,000 to CHEERS; \$90,000 to CEC

ⁱ Average rating price multiplied by the number of ratings in 1996, 1997, and 1998

^j Energy Rated Homes of Colorado 1995 data only

^k Energy Rated Homes of Mississippi

^l Energy Rated Homes of Vermont; funds from utilities and consulting included with funds shown for ratings/dues/sales;

source of state-level funds is Vermont Housing Finance Agency. Beginning with 1996, data are shown by State of Vermont Fiscal Year (July 1–June 30).

^m Virginia Home Energy Rating Organization only

ⁿ Funding from National Home Energy and Resources Organization (N-HERO)

Table A-2. Ratings Completed in the HERS/EEMs Pilot States

State/ Rating System	Prior to CY 1993	CY 1993	CY 1994	CY 1995	CY 1996	CY 1997	CY 1998	Total CY 1993– CY 1998	Totals
Alaska	4,572 ^a	2,794	3,293	2,869	1,044	1,598 ^b	2,607	14,205	18,777
AHFC*					416	1,021	2,092	3,529	
ERH-AK*					628	577	515	1,720	
Arkansas	75 ^c	152	98	119	98	87	69	623	698
California ^d	—	6,369	8,378	548	1,302	2,374	4,674	23,645	23,645
Colorado ^e	—	—	—	185	529	1,284	1,814	3,812	3,812
Mississippi	—	—	—	—	32	21	19	72	72
Vermont	1,352 ^f	350	363	427	523 ^g	381	354	2,398	3,750
Virginia	—	40 ^h	250	7,345	4,275	3,000	3,500	18,410	18,410
Totals	5,999	9,705	12,382	11,493	7,803	8,745	13,037	63,165	69,164

Source: Data are from the HUD/FHA EEMs pilot states HERS providers organizations.

^a CY 1986–CY 1992

^b In 1997 a HERS competitor also started doing ratings in Alaska.

^c CY 1992

^d Includes all but one HERS provider in California for 1994–1998.

^e Colorado did not begin ratings until 1995.

^f CY 1988–CY 1992

^g Data for CY 1996–CY 1998 converted from fiscal year to calendar year format. Actual data are 277 for 1/96–6/96, 492 for 7/96–6/97, 270 for 7/97–6/98, and 219 for 7/98–12/98.

^h Manassas, Virginia pilot project (occurred prior to pilot program's advent).

ⁱ Data for Vermont are for State of Vermont Fiscal Year (July 1–June 30).

*The Alaska program separated in 1996 (see the Alaska program description).

Table A-3. Mortgage Activities in the HERS/EEMs Pilot States

Pilot State	Fiscal Year	FHA Loans			FHA EEMs			DVA Mortgages			DVA EEMs		
		Number	Total \$ Value ^a	Avg. \$ Value	Number	Total \$ Value ^a	Avg. \$ Value	Number	Total \$ Value ^a	Avg. \$ Value	Number	Total \$ Value ^a	Avg. \$ Value
Alaska (AK)	1993	4,287	444	117,584	0	—	—	1,679	188	111,687	6	0.28	47,110
	1994	6,049	627	110,681	16	1.76	NA	3,263	356	108,976	4	0.51	126,917
	1995	2,616	279	119,234	189	1.89	NA	2,489	308	123,699	9	1.11	123,055
	1996	3,230	369	114,192	9	1.37	151,891	2,205	281	127,324	4	0.52	131,087
	1997	3,244	403	124,200	12	1.55	129,578	1,848	251	135,563	1	0.12	117,256
	1998	4,049	499	123,119	32	3.98	124,496	2,469	337	136,609	3	0.34	111,818
Arkansas (AR)	1993	9,621	517	48,315	0	—	—	2,565	170	66,312	9	0.42	46,639
	1994	12,324	668	59,012	13	0.86	NA	6,022	398	66,089	19	1.18	62,329
	1995	7,380	395	60,935	30	1.67	NA	2,758	193	70,032	17	0.93	54,633
	1996	8,799	511	58,066	18	1.21	67,114	3,242	245	75,635	11	0.64	57,951
	1997	7,397	438	59,205	17	1.51	88,704	2,633	202	76,731	20	1.08	53,954
	1998	8,138	506	62,160	189	12.03	63,667	3,319	267	80,499	12	0.90	75,028
California (CA)	1993	83,825	8,302	102,874	47	5.40	NA	27,425	3,578	130,455	9	1.36	150,751
	1994	135,140	13,694	98,274	261	26.94	NA	75,174	9,787	130,189	66	9.52	144,201
	1995	69,809	7,318	111,706	740	79.49	NA	22,555	3,070	136,128	27	3.73	138,177
	1996	104,822	11,263	107,444	1,313	141.92	108,091	33,339	4,697	140,901	46	6.32	137,440
	1997	109,125	11,799	108,122	1,295	139.92	108,044	24,330	3,429	140,918	53	6.76	127,482
	1998	180,880	20,520	113,444	2,386	270.86	113,522	37,022	5,339	144,201	47	6.15	130,745

Table A-3. Mortgage Activities in the HERS/EEMs Pilot States (cont'd.)

Pilot State	Fiscal Year	FHA Loans			FHA EEMs			DVA Mortgages			DVA EEMs		
		Number	Total \$ Value ^a	Avg. \$ Value	Number	Total \$ Value ^a	Avg. \$ Value	Number	Total \$ Value ^a	Avg. \$ Value	Number	Total \$ Value ^a	Avg. \$ Value
Colorado (CO)	1993	52,859	3,801	81,828	NA	NA	NA	10,383	925	89,069	11	1.66	150,751
	1994	63,628	4,549	84,054	NA	NA	NA	22,321	2,025	90,700	7	0.60	85,941
	1995	19,408	1,511	87,621	NA	NA	NA	8,328	850	102,053	7	0.79	112,558
	1996	29,243	2,585	96,893	33	3.40	102,974	10,824	1,214	112,196	4	0.42	105,640
	1997	26,412	2,530	104,294	143	15.52	108,526	9,137	1,089	119,178	7	0.65	92,152
	1998	39,202	3,986	107,373	930	109.05	117,256	12,934	1,614	124,826	2	0.35	173,329
Mississippi (MS)	1993	7,932	446	62,804	NA	NA	NA	1,993	131	65,666	38	3.10	81,747
	1994	10,983	625	60,333	NA	NA	NA	4,851	329	67,721	5	0.30	80,340
	1995	5,516	315	61,994	NA	NA	NA	2,156	157	73,041	2	0.13	68,775
	1996	6,996	432	66,665	0	—	—	2,290	181	79,119	1	0.04	44,250
	1997	6,497	420	70,819	2	0.20	102,326	2,131	171	80,184	3	0.24	80,637
	1998	7,653	521	80,196	95	6.57	69,129	2,686	230	85,579	2	0.20	98,933
Vermont (VT)	1993	310	26	87,498	0	—	—	109	11	101,981	1	0.07	77,040
	1994	510	45	85,709	3	0.29	NA	496	49	97,921	2	0.26	132,440
	1995	210	16	95,491	0	—	—	265	26	96,579	1	0.06	63,943
	1996	289	26	89,851	1	0.12	116,750	313	32	100,992	2	0.16	77,805
	1997	359	30	84,405	2	0.23	114,570	192	20	105,099	4	0.47	117,527
	1998	489	41	83,655	3	0.35	117,739	329	33	101,779	1	0.11	111,997

Table A-3. Mortgage Activities in the HERS/EEMs Pilot States (cont'd.)

Pilot State	Fiscal Year	FHA Loans			FHA EEMs			DVA Mortgages			DVA EEMs		
		Number	Total \$ Value ^a	Avg. \$ Value	Number	Total \$ Value ^a	Avg. \$ Value	Number	Total \$ Value ^a	Avg. \$ Value	Nuber	Total \$ Value ^a	Avg. \$ Value
Virginia (VA)	1993	36,017	3,002	84,974	17	1.24	NA	22,051	2,348	106,477	12	1.45	—
	1994	53,880	4,533	90,422	47	4.08	NA	47,548	4,936	103,820	76	10.58	139,182
	1995	23,658	2,005	89,620	72	7.38	NA	20,972	2,347	111,910	127	16.42	129,325
	1996	31,127	2,760	88,684	151	15.30	101,322	21,115	2,439	115,531	110	14.14	128,586
	1997	27,372	2,494	91,115	157	15.83	100,855	16,923	2,030	119,976	40	4.53	113,371
	1998	40,258	3,870	96,128	375	37.07	98,844	25,957	3,202	123,367	31	3.21	103,606

Source: Data are from the cognizant mortgage organizations.
^a In million dollars

Appendix B. Contact Information for HERS Providers in the HERS/EEMs Pilot States

Alaska

Contact name: Phil Kaluza, Energy Specialist II, Research and Rural Development
Name of organization: Alaska Housing Finance Corporation
Name of HERS program: AHFC Home Energy Rating Program
Street Address or P.O. Box: P.O. Box 101020
City: Anchorage
State: AK
Zip: 99510-1020
Phone: 907-330-8166, 907-336-6100
Fax: 907-338-1747
E-mail: pkaluza@ahfc.state.ak.us (Web site: www.ahfc.state.ak.us)
Type of organization: Non-stock public corporation
Date formed: 1984

Contact name: Barbara Collins
Name of organization: Energy Rating Homes of Alaska, Inc.
Name of HERS program: Energy Rated Homes of Alaska, Inc.
Street Address or P.O. Box: P.O. Box 112642
City: Anchorage
State: AK
Zip: 99511
Phone: 907-345-4963
Fax: 907-348-0468
E-mail: bcollins@compuserve.com
Type of organization(s): Non-profit educational organization
Date formed: 1986

Arkansas

Contact name: Jeremiah Gardner, Executive Director
Name of Organization: Energy Ratings, Inc. (dba Energy Rated Homes of Arkansas)
Name of HERS program: Same
Street Address or P.O. Box: 5401 JFK Blvd, Suite C-2
City: North Little Rock
State: AR
Zip: 72116
Phone: 501-771-2299
Fax: 501-771-1498
E-mail: energyratings@aristotle.net
Type of organization(s): HERS provider [not-for-profit] 501 (c)(3)
Date formed: 1986

California

Contact name: Bob Raymer
Name of organization: Building Industry Institute
Name of HERS programs: Multiple HERS providers: CHEERS, Rated Energy Plus, CEMCO, Con Sol, Inc., EEMs, Inc., Federal Energy Services, H&L Energy Savings
Street Address or P.O. Box: 1107 - 9th Street, Suite 1060
City: Sacramento
State: CA
Zip: 95814
Phone: 916-443-7933
Fax: 916-443-1960
E-mail: rraymer@cbia.org
Type of organization(s): Educational nonprofit
Date formed: 1993

Colorado

Contact name: Megan Edmunds
Name of organization: Energy Rated Homes of Colorado (a program at Colorado Housing and Finance Authority)
Name of HERS program: E-Star
Street Address or P.O. Box: 1981 Blake Street
City: Denver
State: CO
Zip: 80202
Phone: 303-297-7380
Fax: 303-297-0948
E-mail: megane@colohfa.org
Type of organization(s): Home energy rating program, housed at the state housing finance authority
Date formed: January 1, 1995

Mississippi

Contact name: Linda Perry
Name of organization: Energy Rated Homes of Mississippi, Inc.
Name of HERS program: Same
Street Address or P.O. Box: 5250 Galaxie Drive, Suite 1
City: Jackson
State: MS
Zip: 39206
Phone: 601-981-6699
Fax: 601-981-6089
E-mail: erhms@netdoor.com
Type of organization(s): Private nonprofit
Date formed: December 1993

Vermont

Contact name: Richard Faesy
Name of organization: Vermont Energy Investment Corp.
Name of HERS program: Energy Rated Homes of Vermont
Street Address or P.O. Box: 255 S. Champlain Street
City: Burlington
State: VT
Zip: 05401
Phone: 802-865-3926 ext. 16
Fax: 802-658-1643
E-mail: rfaesy@veic.org
Type of organization(s): 501(c)(3) Non-profit corporation
Date formed: ERH-VT incorporated: October 1987, VEIC incorporated: November 1986

Virginia

Contact name: Christine K. Lowrie
Name of organization: Virginia Home Energy Rating Organization, Inc.
Name of HERS program: Same
Street Address or P.O. Box: 804 Moorefield Park Drive, Suite 101
City: Richmond
State: VA
Zip: 23236
Phone: 804-560-9134
Fax: 804-560-9139
E-mail: n-hero@ix.netcom.com
Type of organization(s): Non-profit HERS
Date formed: September 21, 1992

Appendix C. Alaska Housing Finance Corporation Interest Rate Reduction for Energy Efficiency

Home buyers who obtain an Alaskan Housing Finance Corporation (AHFC) loan may qualify for an interest rate reduction, depending on the energy efficiency of the home.

New Construction

*Properties served by or with access to natural gas Properties without access to natural gas

5 Star	0.50% interest rate reduction	5 Star	1.00% interest rate reduction
5 Star Plus	0.75% interest rate reduction	5 Star Plus	1.50% interest rate reduction

*A property with access to natural gas is defined as one which has natural gas already to the site or one for which natural gas is available at a cost that does not exceed 5% of the appraised value of the property.

Existing Construction

Areas Served by or with
Access to Natural Gas

Properties without Access to
Natural Gas

Increase in Energy Rating

Increases in Energy Rating

1 Step	.250%	1 Step	.375%
2 Step	.500%	2 Step	.750%
3 Step	.750%	3 Step	1.125%
4 or more Steps	1.00%	4 or more Steps	1.500%

In addition to the improvements resulting in a “step increase” in the energy rating, the improvements must increase the rating by a minimum of 5 points for each applicable reduction in rate. For example, an urban area home has an existing rating of 44 and the efficiency must increase by 6 points to move to the next step. This improvement would result in an interest rate reduction of 1/4% because both the “step increase test” and the “point increase test” were met. However, if the existing home had an initial energy rating at 47 points, the improvement would have to increase the rating to 52 points before a 1/4% rate reduction would be available (even though the next step would have required only a point value of 50). If a home is eligible for a 2 Step increase and a resultant rate reduction of 1/2%, the points also would have to increase by at least 10 to be eligible for the full 1/2% rate reduction. It is important to realize that the rate reduction applies only when an improvement results in a step increase and a minimum point increase of 5 for each step.

Regardless of the availability of natural gas or the age of the dwelling (new construction or existing), rate reductions are subject to a maximum loan of \$175,000 on properties located in areas not meeting the definition of a small community and \$200,000 on properties located in areas meeting the definition of a small community.

Appendix D. Energy Rated Homes of Alaska

Example A FIVE STAR Home In New Construction

LOCATION:	Southcentral Alaska
HOUSE TYPE:	Two-story home on crawl space with attached 2-car garage, approximately 2,000 square feet of living area
CEILING:	R-38 insulation (minimum)
WALLS:	R-19 insulation (minimum)
CRAWL WALLS:	R-19 insulation to footings
WINDOWS:	12% or less window to wall ratio, R-2.86 windows minimum documented by NFRC. Please note: "Windows" includes the glazed portion of doors and patio doors.
AIR LEAKAGE:	Level D – Less than 3.0 ACH at 50 Pa (verified by a blower door test) Homes should have no significant electrical or plumbing penetrations, continuous vapor barriers, complete weatherstripping, adequately caulked joints and cracks, dampers on all vents and house wrap overlapped and sealed by caulk or tape at joints and around all openings. Mechanical ventilation recommended at this level of air tightness.
SOLAR GAIN:	Recommended but not required.
WATER HEATING:	A wrapped, on demand, "energy efficient" tank which has more insulation or is integrated with storage. For example: two 40-gallon water heaters with an energy factor of .54 or greater.
WATER CONSERVATION:	Flow restricting shower heads, 2.5 gallons per minute or less; faucet aerators.
SPACE HEATING DEVICES:	Minimum 90% efficient, documented by independent test data. Automatic setback thermostats.

Note: This is an example only. It is not the only way for a home to achieve a 4 Star Plus rating. To personalize this Rule of Thumb to your own plans, contact your ERHA energy rater. For more information about the ERHA rating program or energy efficient financial incentives available to home owners, call Energy Rated Homes of Alaska at 563-6740 in Anchorage or 1-800-478-3744 in the rest of the state.

March 1995

Appendix E. Energy Rated Homes of Arkansas Brochure

Because you live in Arkansas . . .

. . . and Arkansas is one of five states selected by the United States Department of Housing and Urban Development to test its new **FHA Energy Efficient Mortgage**, you have the opportunity to improve your level of comfort and your lifestyle!

The HUD FHA Energy Efficient Mortgage allows you, at the time of purchase of an existing home, to **finance additional dollars for energy improvements** on the basis that the savings on your monthly energy bills will meet or exceed the extra amount you pay monthly for the cost of the improvements.

Improvements may include such things as the replacement of outmoded heating equipment, the installation of central air, increased insulation, more efficient window systems, duct repair and sealing, etc.

All of these improvement will be recommended by your rating report to make your home more comfortable to live in, lower your utility bills, and put extra money in your pocket.

Your loan officer will help you through the process of obtaining and fulfilling the terms of the HUD FHA Energy Efficient Mortgage, and **all with no delay** or additional qualification procedures than if you were obtaining an ordinary FHA loan. Basically, there are five easy steps . . .

The Call . . .

1. Contact a participating lender. Ask your bank if they are an FHA approved lender. If they are not, contact your local HUD/FHA office for a list of approved lenders.

The Rating . . .

2. Obtain a home energy rating. Obtain analysis from an energy rater for the house you plan to purchase or refinance. Contact your state energy office or energy raters.

The Lender . . .

3. Provider energy rating to lender. Use the rating recommendations to select the cost-effective improvements. Provide your home energy rating and list of improvements to your lender for approval. Improvements will be inspected before funds are released from escrow. Up to \$250 may be financed for the initial and final inspections.

The Loan . . .

4. Close loan and install improvements. After closing, you can begin to have the measures installed. Take up to 90 days after loan closing to complete the installation.

Verification . . .

5. Get a post-installation inspection from the rater. Then use the savings on your utility bill to help repay the loan—and rest easy with the increased comfort that the energy improvements provide.

Appendix F. California Home Energy Efficiency Rating System Brochure Excerpts

3 CHEERS for . . . C.H.E.E.R.S.

California's New Program for Rating Your Home's Energy Efficiency

1. Lower Your Energy Bills! CHEERS makes sense and saves dollars.

Energy costs are the second-largest homeowner expense right after your monthly mortgage payment. The CHEERS Rating gives you the information you need to lower your energy bills. It evaluates such details as the level of insulation and the types of lighting and windows in your house. Recommendations for improvements are accompanied with cost estimates as well as projections for annual energy savings.

2. Increase the Value of Your Home! With a CHEERS rating, the value of your home goes up, while your energy bills go down

Energy efficient homes are better homes. They're more comfortable. And, they're cleaner and quieter. Homes with a high CHEERS Rating also have a competitive advantage when being sold. A high CHEERS Rating tells the buyer that the home is energy efficient. It also tells the buyer that they will be spending less on utility bills so they can spend more on their home. And, it tells buyers that there are no hidden surprises in the form of high utility costs.

Buyers of a home rated by CHEERS may also qualify for an Energy Efficient Mortgage. These mortgages allow buyers to buy larger homes than they would normally qualify for. Homeowners can also finance CHEERS recommended improvements through these special mortgages. Be sure to ask your realtor and lender for additional information.

3. Help Preserve Our Environment! Helping our environment: that's really something to cheer about!

Saving energy is also good for our environment. An energy efficient home causes less pollution. Saving energy also improves air quality and conserves natural resources.

Using energy wisely means slower depletion of our natural resources. By conserving energy, the need for new power plants which add to our air pollution problems can be eliminated.

The State of California predicts that home energy requirements will continue to increase annually. To meet this growing demand, California is relying on more efficient use of energy in the home.

**California Home Energy
Efficiency Rating Systems**

1-800-424-3377

Appendix G. Energy Rated Homes of Colorado Brochure

How Much More Buying Power Do You Get From An E-Star™ Certified Home?

Purchasing an E-Star™ certified home gives you the ability to qualify for an energy-efficient mortgage, which can dramatically increase your buying power.

Income	Purchase Price You Can Normally Afford	Purchase Price with E-Star™ Home
\$30,000	\$77,681	\$84,495
\$34,000	\$88,357	\$96,079
\$38,000	\$98,351	\$106,982
\$42,000	\$109,026	\$118,566
\$46,000	\$119,020	\$129,469
\$50,000	\$129,696	\$141,053
\$54,000	\$140,372	\$152,637
\$58,000	\$150,366	\$163,540
\$62,000	\$161,041	\$175,124
\$66,000	\$171,717	\$186,708
\$70,000	\$181,711	\$197,611
\$74,000	\$191,705	\$208,513
\$78,000	\$203,062	\$220,779
\$82,000	\$213,056	\$231,681
\$86,000	\$223,050	\$242,584
\$90,000	\$233,044	\$253,487
\$94,000	\$243,720	\$265,071
\$98,000	\$254,395	\$276,655
\$100,000	\$259,392	\$282,106

Don't Buy a Home Unless It's an E-Star™ Certified Home

Buy an E-Star™ Certified Home and Save \$ome \$ome Green!!

For more information, contact:
Energy Rated Homes of Colorado
(303) 297-7395

1-800-877-8450

E-Star™ Energy Rated Homes of Colorado

Appendix H. Energy Rated Homes of Mississippi

ENERGY RATED HOMES OF MISSISSIPPI, INC.

CODE OF ETHICS

Honesty, justice, and courtesy form a moral philosophy which, associated with mutual interest among people constitutes the foundation of ethics. Energy Rated Homes of Mississippi recognizes that such a standard requires not impassive observance, but as a set of dynamic principles guiding our conduct and services that we provide. It is our duty to practice our profession according to this Code of Ethics.

The keystone of professional conduct is integrity, Energy Rated Homes of Mississippi will strive to consistently discharge our duties with fidelity to the public, our clients, and with fairness and impartiality to all. Energy Rated Homes of Mississippi will uphold the honor and dignity of our profession and avoid association with any enterprise of questionable character, or apparent conflict of interest.

- Energy Rated Homes of Mississippi as a professional organization will make statements only when they are based on facts supported by a rating or by research performed by a recognized professional source.
- Energy Rated Homes of Mississippi as a professional organization (and all associated Raters and affiliated organizations) will always act in good faith towards each client. A disclosure form indicating any connection to any energy efficiency products or services besides ratings will be provided to the client as requested by the client. Energy Rated Homes of Mississippi (and all associated Raters and affiliated organizations) will not allow an interest in any business or enterprise to affect the quality or results of a rating that is performed.
- Energy Rated Homes of Mississippi as a professional organization (and all associated Rater and affiliated organizations) will recommend to the client that the client obtain more than one bid prior to selecting any contractor to provide any of the recommended improvements associated with the rating.
- Energy Rated Homes of Mississippi as a professional organization (and all associated Rater and affiliated organizations) will not disclose any information concerning the results of a rating without the written approval of the client or their representative with the exception of information on energy consumption for the purposes of monitoring and evaluation.
- Energy Rated Homes of Mississippi as a professional organization (and all associated Rater and affiliated organizations) will not accept nor offer commissions nor allowances directly from or to other parties dealing with their client in connection with work for which Energy Rated Homes of Mississippi is responsible without the written approval of the client or their representatives.
- Energy Rated Homes of Mississippi as a professional organization (and all associated Rater and affiliated organizations) shall make every effort to uphold, maintain, and improve the professional integrity, reputation and practice of the organization and its certified Raters.

Appendix I. Energy Rated Homes of Vermont

Fact Sheet The 'YESS' Mortgage from VHFA

The Yearly Energy Savings System (YESS) Mortgage Program allows borrowers eligible for financing from the Vermont Housing Finance Agency (VHFA) to make their homes more energy efficient and comfortable while they benefit from a *great* mortgage interest rate.

YESS Program Benefits

- * Buyers pay a reduced interest rate:

Year 1	4.95%
Year 2	5.45%
Year 3	5.95%
Years 4 - 30	6.45% (6.28% APR)
- * Buyers qualify at the first-year interest rate of 4.95%.
- * YESS finances up to 100% of the cost of approved energy improvements.
- * The appraised value of the home is increased by the cost of the energy improvements that will be installed.

Energy-Saving Features

Improvements: Energy improvements must be cost-effective* and total at least \$2,500. (A 4 Star Energy Rating is not required.)

Energy Improvement Mortgage Service:

Energy Rated Homes of Vermont, a nonprofit organization, will: (1) perform a Home Energy Rating and recommend energy improvements that will save you money - guaranteed; (2) secure written bids from contractors; (3) prepare appropriate documents for inclusion in your loan file; and (4) after the closing will schedule and oversee the energy improvements. The Energy Improvement Mortgage Service Fee can be financed as part of the YESS mortgage for as little as \$5 per month. Utilities may pay for some or all of this fee. **It's risk-free and guaranteed to be cost-effective!**

YESS Qualifying Details

- Eligible Properties:** Existing homes in Vermont, including:
 - * Single-family homes (including mobile and modular homes)
 - * Duplexes
 - * Condominium units in VHFA-eligible developments
- Eligible Borrowers:** Buyers who meet VHFA income guidelines and are eligible for VHFA financing
- Terms:** 1 point origination fee; 30-year mortgage terms
- Available from:** Participating VHFA lenders
- Mortgage Insurers:** USDA Rural Development, VA, FHA, MGIC or qualified private mortgage insurers

Sponsoring Organizations: VHFA, Energy Rated Homes of Vermont, USDA Rural Development

*An energy improvement is "cost effective" if it's shown to save more money each year than the additional mortgage amount required to finance it. For more information, call the **VHFA Helpline: 1-800-287-8432**.

Appendix J. Virginia Home Energy Rating Organization

Virginia Senate Joint Resolution No. 339 Passed January 29, 1999

Commending the Virginia Home Energy Rating Organization.

Patrons—Lambert Bolling, Colgan, Forbes, Hanger, Hawkins, Houck, Howell, Marsh, Marye, Maxwell, Miller, K.G., Miller, Y.B., Newman, Norment, Quayle, Saslaw, Schrock, Stolle, Trumbo, Wampler, Watkins, Williams and Woods; Delegates: Baker, Baskerville, Behm, Bloxom, Brink, Cantor, Crittenden, Croshaw, Dickinson, Drake, Hamilton, McEnchin, Sherwood and Shuler

WHEREAS, the Virginia Home Energy Rating Organization (V-HERO) was founded in 1992 by the Virginia Department of Mines, Minerals and Energy and serves as an independent, not-for-profit organization; and

WHEREAS, Virginia HERO is the statewide home energy rating system for the Commonwealth and is widely held to be the foremost program of its type in the country and is the model for a national program that offers similar services in 37 states, the District of Columbia, and Canada; and

WHEREAS, in the six years since Virginia HERO was founded, more than 18,000 homes in Virginia have been rated and improved; and

WHEREAS, for homes rated and improved by Virginia HERO, the energy efficiency improvement ranges from 30 to 60 percent, resulting in a reduction in harmful greenhouse gas emissions; and

WHEREAS, for each improved house, an average of four tons of carbon dioxide annually have not been emitted into the atmosphere, a total savings of more than 72,000 tons of carbon dioxide emissions each year; and

WHEREAS, Virginia HERO's planned program of ratings and energy efficiency mortgages for new and existing residences gives Virginia an opportunity to use this program as part the Commonwealth's Environmental Protection Agency compliance for emissions abatement and clean air standards; and

WHEREAS, Virginia HERO has provided training and certification to more than 1125 energy raters in Virginia, resulting in the creation of a new industry; and

WHEREAS, new, efficient, inner-city homes in Richmond are being built to Virginia HERO standards and will enable Virginia to apply to be recognized as having the first 5 Star, Energy Star affordable housing community in the United States; and

WHEREAS, Virginia HERO is assisting in bringing quality construction to the inner city an average savings to the citizens of the Commonwealth of 48 percent on utility costs; now, therefore, be it

RESOLVED by the State, the House of Delegates concurring, That the General Assembly commend the Virginia Home Energy Rating Organization on its status as one of the leading programs of its type in the country; and, be it

RESOLVED FURTHER, That the Clerk of the Senate prepare a copy of this resolution for presentation to Christine Lowrie, executive vice president, in recognition of Virginia HERO's outstanding contributions to the improvement of energy efficiency in home throughout the Commonwealth.

REPORT DOCUMENTATION PAGE

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