Linking Home Energy Rating Systems with Energy-Efficiency Financing: National and State Programs

Nancy E. Collins, Q[4] Associates
Barbara C. Farhar, National Renewable Energy Laboratory
Roberta Ward Walsh, University of Vermont

Creation and subsequent institutionalization of energy-efficiency financing (EEF) products are gaining momentum across the nation and, in the process, transforming the housing marketplace by improving the energy efficiency of the housing stock. In concert with the U.S. Department of Energy (DOE), the Federal Housing Administration (FHA), the Rural Economic and Community Development Service (RECDS, formerly the Farmers Home Administration), the Department of Veterans Affairs (DVA), the Federal National Mortgage Association (Fannie Mae), and the Federal Home Loan Mortgage Corporation (Freddie Mac), states are supporting the development of EEF products linked with home energy rating systems. States in the forefront of these developments include the five selected to pilot a U.S. Department of Housing and Urban Development (HUD) program requiring that existing homes be rated in order to qualify for an FHA energy-efficiency mortgage (EEM): Alaska, Arkansas, California, Vermont, and Virginia. In October 1995, HUD extended EEMs to new homes and to all 50 states; the DVA program also offers EEMs in all states. In addition, Colorado is in the process of piloting a Fannie Mae program that offers both EEMs and energy improvement mortgages (EIMs).

During 1995, national- and state-level data on EEMs were collected from cognizant agencies and institutions on the mortgages they insured, guaranteed, or purchased. In addition, data were gathered on the number and value of energy-improvement mortgages actually completed. Summarized in this paper is information on ratings completed and their use for financing improvements; raters and rating organizations; organizations involved in establishing rating systems; and training for lenders, builders, and real estate agents. The lending products summarized include those of the mortgage community mentioned above; utility/rating financing partnerships; private financing; and state financing programs. One lesson learned from the pilots is that FHA EEMs reach only a small segment of the new and existing home markets—usually first-time home buyers and lower- and middle-income borrowers. Without a larger market, the demand for ratings is small and most likely insufficient to support a rating industry. The result has been that HERS provider organizations have worked actively to expand ratings-linked products offered by utilities, state housing finance agencies, mortgage lenders, and the secondary market.

INTRODUCTION

Background

Government agencies and the private housing industry have been cooperating since 1991 to establish voluntary programs that link home energy rating systems (HERS) with energy efficient mortgages (EEMs) and other lending products to finance energy improvements in housing. The assumption underlying these programs is that money saved on utility bills over the long term will more than offset the cost of making energy-efficiency improvements—which are added to the total loan amount—and, therefore, default rates for loans with slightly higher payments will not be any greater than for conventional loans. The long-term benefit (and goal) of these programs is to improve the energy efficiency of the nation's housing stock.

HERS and EEMs programs, both of which have existed independently at various local, state, and national levels for more than a decade, are being accelerated by three 1992 federal laws: (1) The Energy Policy Act (EPact) directs the U.S. Department of Energy (DOE) to develop guidelines for a uniform, voluntary HERS, evaluate the effectiveness of the HUD/FHA pilot EEMs program, and document training activities; (2) the Housing and Community Development Act of 1992 requires that FHA conduct EEMs pilot programs in five states, report on success, and based on the report, expand the program nationwide; and (3) the Veterans Home Loan Program Amendments of 1992 require that the DVA conduct a demonstration EEMs program in 50 states for veterans.

In general, most performance-based home energy rating systems calculate the energy efficiency of a house on a scale

from 0 to 100. A state's energy-efficiency standards must meet or exceed the Council of American Building Officials' Model Energy Code of 1992 (CABO-MEC '92) and a value on the rating scale must be associated with these standards. To simplify use of the ratings, the scales are often abbreviated using a star system, as illustrated by Alaska's, shown in Figure 1. In late 1995, 17 rating systems existed in 15 states, and more are being developed in 1996, partly in response to the FHA offering EEMs nationwide.

The generic mortgage process is complicated and involves many different roles during the buying and selling of a home—many of them not apparent to the consumer. Participants in the home sale include, of course, the seller (either consumer, mortgage holder if a foreclosure, or builder/contractor), the buyer, and the real estate agent, who is the ''ringmaster.'' In some states, both buyer and seller are represented by lawyers. The buyer may find a lender directly, the agent may identify a lender on behalf of the buyer, or a mortgage broker may find a lender. The mortgage paperwork is examined by an underwriter and is completed by an officer at the financial institution, the appraisal is conducted, inspections are completed, disclosures are prepared, and signatures are obtained to complete the sale. With all of these steps, it is difficult to introduce a new financing product that would add time and staff cost to the process. This complexity represents a significant barrier in introducing EEF products.

After a conventional mortgage is in place, the financial institution often sells it on the secondary market (e.g., to Fannie Mae or Freddie Mac). Institutions in the primary and secondary markets do not want to increase the risk of defaults; they are wary of home loans that may stretch the limits of the buyers' ability to make mortgage payments. Risk aversion in the financial community is another major barrier that has to be overcome if EEF products are to be widely used.

Scope of the Paper

This paper summarizes information about the progress of EEF products at the national level. It also documents the development of EEF products linked with HERS in the five HUD pilot states. The purpose is to describe organizations involved and their roles, progress in training raters, conducting ratings, measures of success in linking home energy ratings with EEF products. Collection of the data followed a protocol established in an evaluation plan (Collins et al. 1994) and, although the case studies produced trace activities in each state from the beginning (in some cases 15 years), the focus of this paper is on 1993–1995, the period since EPact was passed. Preliminary findings based on observations about and data from the pilot states are presented.

METHODOLOGY

Evaluation Design

In 1991 and early 1992, DOE's National Renewable Energy Laboratory (NREL) coordinated meetings of the National Collaborative on HERS and EEMs, composed of representatives from 25 stakeholder organizations (Farhar & Eckert 1993). One conclusion reached by the Collaborative was the importance of evaluating the development process of HERS/EEMs, estimating the impacts of the pilot state efforts, and sharing the results with other states. Therefore, in 1994, NREL worked with national- and state-level stakeholders to write a detailed evaluation plan that would provide national

Figure 1. *Example of a Home Energy Rating System Scale (Alaska)*

Average 1980 home ↓ | 1992 BEES[a] ↓ | 1995 BEES[a] ↓

0-39	40-49	50-59	60-69	70-74	75-78	79-84	85-89	90-100	ACHP[b]
☆	☆+	☆☆	☆☆+	☆☆☆	☆☆☆+	☆☆☆☆	☆☆☆☆+	☆☆☆☆☆	☆☆☆☆☆+
Below Average		Fair		Good		Efficient		Very Efficient	

Source: Alaska Housing Finance Corporation.
[a]BEES is Alaska's Building Energy-Efficiency Standard.
[b]Houses certified by the Alaska Craftsman Home Program (ACHP).

data for use by the states, as well as a method for aggregating state data at the national level.

The plan covers three types of evaluation: (1) short-term process evaluation and feedback (monitoring and market response) to identify implementation barriers and learn how they were overcome; (2) traditional process evaluation, focusing on comparing characteristics of the various approaches to determine the program characteristics associated with the most successful programs; and (3) impact evaluation, which collects data for a causal analysis linking programmatic actions with key outcomes such as loan default rates and housing affordability.

Data Collection Procedures

During 1995, NREL began data collection efforts at the national level and from the FHA pilot states. At the national level, considerable effort was put into obtaining information from HUD, DVA, RECDS, Freddie Mac, and Fannie Mae on mortgages and loans underwritten, purchased, or made during FY 1993, FY 1994, and FY 1995. Total numbers and values of mortgages and loans provide a look at the market potential for EEF products. In addition, where available, these data were obtained for the pilot states.

At the pilot state level, NREL undertook the development of case studies, documenting process evaluation-related activities in each one from inception through December 1995 and collecting available impact evaluation data. A protocol based on the evaluation plan was established that delineated both impact and process data to be collected. This included: background of rating programs; evolution of loan products; implementation costs and participants; rating systems and use of ratings; training and education; marketing and outreach; market transformation achieved; program evaluation and data collection systems; barriers encountered and overcome; lessons learned; successes; and near- and long-term plans.

Among the limitations to the data collection efforts conducted in 1995 were:

(1) National-level data are difficult to obtain, either due to its proprietary nature, confidentiality issues, or cost. Furthermore, identifying EEMs in the HUD/FHA database is not always possible; not all EEMs are identified as such, and some are coded as EEMs but are not.

(2) Because programs and activities operate in the highly volatile housing market, monitoring events was like shooting at moving targets. In fact, for several pilot states, major changes occurred late in 1995 or during 1996 that changed how some rating organizations operated and how some state programs were designed. These events point to the need to collect process and impact data on an annual basis, updating the case studies for an accurate understanding of how HERS/EEF systems can be effectively institutionalized.

(3) Not all stakeholders could be contacted because of limited funding, so in some states, all data available have not yet been obtained and some reliability issues regarding the data have not been resolved.

EEF PRODUCTS AND THE HOUSING MARKET

With FHA EEMs now offered nationwide, the housing market recovering from a multi-year slump, and utilities beginning to eliminate rebates and other demand-side management (DSM) programs, many states are initiating HERS/EEMs programs. This nationwide movement involves public/private partnerships, often led by state energy offices (SEOs) or their equivalent. Collecting data on lending at the national and state levels permits an assessment of the market potential for EEF products and, hence, how ratings can be used.

EEF Products

Energy efficient mortgages. HUD/FHA will underwrite EEMs that permit up to $4,000 or 5% of the appraised value (up to $8,000) to the loan amount for energy improvements based on ratings for new and existing single-family homes. The DVA EEMs allow the addition of $3,000 for energy improvements, or up to $6,000 for improvements if energy savings will be greater than the increased monthly payment. Some state housing finance agencies offer below-market interest rate mortgages for energy efficient homes. More and more lenders in the pilot states are offering their own EEMs (i.e., not in conjunction with HUD).

Energy improvement mortgages. Examples of EIMs are HUD refinanced loans and 203(k) loans linked with EEMs. The latter is used to finance rehabilitation and improvements in an existing home. Some state housing finance agencies offer home improvement loans or varying amounts and conditions imposed for the express purpose of installing energy-efficiency measures.

Energy-efficient homes. New homes insured by HUD or made by RECDS after October 1, 1992, had to meet or exceed CABO-MEC ’92 standards.

Other EEF incentives. Some states have selections of loans, rebates, interest-rate buydowns, and incentives available to home owners, buyers, and builders. Incentives may be offered by utilities as part of their demand-side management

programs, by housing finance agencies, and by private/public partnerships. Utilities were, for much of the last decade, in the forefront of offering rebates but, with the recent trend toward competition, they are moving away from rebates and toward energy-efficiency financing programs.

Colorado Fannie Mae Pilot. To develop markets for ratings, rating organizations are proactive in creating new loan and financing products with utility companies and in the private sector: for example, a pilot program with Fannie Mae is being conducted in Colorado (a sixth pilot state in the 1995 NREL process evaluation). The Colorado Housing and Finance Authority (CHFA) is spearheading a partnership with Colorado real estate financing, appraisal, sales, and construction industries; the state's rural, municipal, and investor-owned utilities; Energy Rated Homes of America; Fannie Mae; Freddie Mac; and HUD. As with other state programs, the Colorado goal is to improve the energy efficiency of housing stock. CHFA is training and certifying raters to make the program a market force in Colorado as rapidly as possible. However, this paper focuses on the original five pilot states because Colorado's program began somewhat later.

The Potential Market for EEF Products

Total volume and value of loans made, purchased, or underwritten for FY 1993, FY 1994, and FY 1995 are shown in Table 1 for FHA, DVA, RECDS, Fannie Mae, and Freddie Mac. Also shown are the number and value of FHA and DVA EEMs. However, because FHA EEMs were available only in the five pilot states for the period covered in Table 1, it is inappropriate to look at how many EEMs have been underwritten in the context of national numbers. In future years, these numbers will be better indicators of progress in EEF products. To further understand the market potential, additional data are needed on the total housing market. In California, for example, many homes are financed through jumbo loans (>$203,500) and these are excluded from EEF products now offered, even though many of these homes could benefit considerably from energy-efficiency improvements that would translate into comfort increases and dollar savings because of high energy rates.

Pilot State Market Indicators

Table 2 shows total mortgage (including EEMs) activity in the pilot states for HUD/FHA and DVA during FY 1993, FY 1994, and FY 1995. Also shown are HUD and DVA EEMs. Using the data in both Tables 1 and 2, the average values of conventional loans can be compared to EEMs. The EEMs are higher in about the amounts that would be expected, in line with program parameters. Now that the HUD program is nationwide, more states are starting rating programs, national-level activities are moving forward rapidly, and greater variety in financing products are being made available, tracking these numbers on a larger scale will provide better indicators of progress.

PILOT-STATE ACTIVITIES

Uses of Ratings Linked with EEF Products

One purpose of conducting the case studies in 1995 was to work with state HERS provider organizations to set up systems or databases that would track uses of ratings by home owners to obtain loans, mortgages, or rebates so that HERS could be linked with EEMs. This is, after all, the ultimate measurement of success—to see as many ratings as possible used as the basis for financing—and thereby improving—the energy efficiency of housing.

One example of the results of such tracking systems is shown in Figure 2. It looks at data kept by Energy Plus, a market-driven private rating service operated in California. Energy Plus does a rating when a referral is received for a home buyer who intends to seek a HUD EEM. In 1995, Energy Plus focused on HUD repossessed properties and greatly increased the number of rated houses for which FHA EEMs were completed. (Selling these properties is a performance measure for HUD employees, while insuring EEMs is not.)

Data from Energy Rated Homes of Vermont were used to estimate the use of ratings for EEF products on the basis of lender surveys, follow-up phone calls, market data, and anecdotal evidence. The results (in Table 3) show that 45% of all ratings were used for EEF products. Although these numbers are extrapolations based on the assumptions listed below the table, they demonstrate the importance of looking well beyond FHA EEMs (only three in Vermont) for use of ratings to finance energy efficiency.

Funding the Pilot Programs

Considerable levels of funding have been committed by the public/private partnerships that have established the ratings systems in the pilot states. Funding comes in many forms: the EEF products described above; state energy office funds received from DOE and state budgets; DOE funds; specially legislated program funds; grants; utility programs; private sector in-kind contributions; fees for courses and seminars; fees for processing ratings; and sales of materials (books, videos, rating software). Funding amounts also vary considerably, as shown in Table 4. We caution, however, against making the assumption that these amounts are relative to a state's size (or any other measure), nor should funding be viewed as a subsidy for conducting ratings (as in ''funding divided by number of ratings''). Rather, the organizations that receive the funds have important functions that go well

Table 1. *The Potential for Energy-Efficiency Financing in the United States*

	FY 1993			FY 1994			FY 1995		
	Number	Total $ Value[a]	Average $ Value	Number	Total $ Value	Average $ Value[a]	Number	Total $ Value[a]	Average $ Value
FHA loans insured[b]	943,715	69,342	73,478	1,340,247	100,632	75,084	580,967	45,561	78,423
FHA new loans	53,136	4,670	87,895	61,495	5,796	94,253	42,147	4,016	95,282
FHA EEMs	64	7	103,639	340	34	99,815	862	91	105,079
DVA loans made[b]	383,236	34,633	90,370	602,220	55,141	91,562	263,102	25,340	96,313
DVA EEMs	241	18	76,584	995	88	88,832	863	80	92,919
RECDS loans made	27,531	1,216	44,186	31,206	1,560	50,006	21,455	934	43,532
RECDS loans guaranteed	8,947	540	60,338	11,569	726	62,741	16,677	1,049	62,886
Fannie Mae loans purchased	2,850,256	278,794	97,814	2,334,662	223,915	95,911	1,051,706	100,212	95,286
Freddie Mac loans purchased	2,185,855	214,606	98,135	1,855,767	183,877	99,084	748,437	74,552	99,610

Source: Databases of referenced organizations
[a]In million $.
[b]These are the mortgage markets targeted by the Energy Policy Act of 1992.

beyond training raters, as described in later sections of this paper. Altogether, the purpose is to transform the housing marketplace—creating a need for ratings that is based on a readily available and diverse set of EEF products that are routinely used.

As high as the funding in Table 4 appears, even more has been spent by other organizations involved that has not yet been documented. For example, trade associations are active in training and educating their members; utilities are likely to have considerable in-house costs for staff, programs, advertising, consumer information, and so on; and other stage agencies, such as the oversight agencies, have staff and program expenses. A major question to be answered by continued analysis of the pilot states is ''How much money must be put into the marketplace transformation process, for how long, and to achieve what measurable benefits?''

Ratings Completed in Pilot States

Table 5 shows the numbers of ratings conducted, which vary considerably across the pilot states. This can be attributed to several factors: (1) variation in housing market size; (2) number of years the states had been working toward establishing rating systems; (3) level of financial support; (4) degree of involvement of private sector organizations; and (5) variety of EEF products offered.

If a home owner has received financing for energy-efficiency improvements, a rating is usually required after installation to confirm that actions have been taken; thus, the rating numbers in Table 5 include both ''as is'' ratings and ''post'' ratings. In Alaska, 33% of ''as is'' ratings have ''post'' ratings; in California, 2.5%. In states where ratings are also used for new construction, the initial rating is based on the plans and a final rating is conducted when construction is complete.

Raters and Rater Training

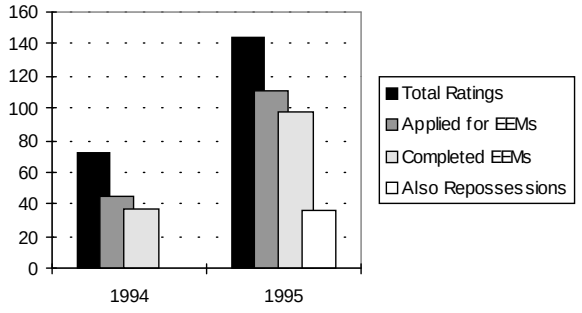
HERS provider organizations train raters in the use of rating systems and software, conducting ratings accurately, marketing EEF products, educating consumers, and connecting con-

Table 2. *Mortgage Activities in the HUD/FHA Pilot States*

		FHA Loans		FHA EEMs		DVA Mortgages		DVA EEMs	
	Fiscal Year	Number	Total Value (million $)	Number	Total Value (million $)	Number	Total Value (million $)	Number	Total Value (million $)
Alaska	1993	4,287	444	0	—	2,304	259	NA	NA
	1994	6,194	627	16	1.76	3,286	358	4	0.51
	1995	2,620	279	18	1.89	2,500	309	9	1.11
Arkansas	1993	9,622	518	0	—	3,870	254	9	0.42
	1994	12,365	671	13	0.86	6,036	399	19	1.18
	1995	7,479	402	31	1.72	2,758	193	17	0.93
California	1993	83,931	8,337	47	5.40	39,030	5,082	11	1.66
	1994	135,178	13,740	261	26.94	75,601	9,843	65	9.36
	1995	69,184	7,310	740	79.49	22,603	3,076	27	3.73
Virginia	1993	36,884	3,070	17	1.24	34,265	3,654	12	1.45
	1994	54,171	4,563	47	4.08	47,946	4,981	71	9.78
	1995	16,215	1,215	73	7.48	21,054	2,354	124	16.10
Vermont	1993	315	28	0	—	233	23	NA	NA
	1994	507	45	3	0.29	529	52	2	0.26
	1995	179	16	0	—	266	26	1	0.06

Source: Databases of referenced organizations

Figure 2. *Use of Ratings Conducted by Energy Plus in California*



sumers with real estate professionals. Rater training, in most cases, takes one week of classroom work, field activities, and testing. In some states, raters must be certified, but responsibility for this certification varies. Depending on location, some raters are able to work full-time, but this is the exception rather than the rule. Table 6 shows the number of certified raters in the pilot states. This is not the same as number trained, since not all of those trained and certified are actively conducting ratings. In most cases, raters work independently, but receive referrals from rating organizations, which also play a quality control function.

Marketing, Training, and Education

Training and educating housing market professionals and the home-buying consumers are important aspects of developing the infrastructure in the marketplace such that the use of ratings becomes an accepted tool for selling homes. We have collected data on numbers of real estate agents, lenders, appraisers, and builders/contractors who have attended classes and training (Table 7). These numbers must be viewed in the context of total state population and the size of each professional group (where available) and there may be some double-counting in these numbers; both issues illustrate the kinds of data availability and reliability that must be resolved as part of the evaluation process. Training ranges from an hour talk 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.

Table 3. *Estimates of Vermont EEF Activity*

Year	Total Ratings	Cumulative Ratings	EEF	Total EEF	Data Source/Notes
1988	217	217	40%	87	Follow-up status calls
1989	487	704	40%	195	Follow-up status calls
1990	202	906	60%	121	Lender survey information
1991	289	1,195	60%	173	Lender survey information
1992	157	1,352	60%	94	Lender survey information[a]
1993	350	1,702	48%	169	36% of ratings ordered were market; 64% utility[b]
1994	363	2,065	40%	145	23% of ratings ordered were-market; 77% utility[c]
1995	427	2,492	57%	128	49% of ratings ordered were market; 51% utility[d]
TOTAL	2,492	2,492	—	1,113	

Source: Energy Rated Homes of Vermont lender surveys.

[a]Lender surveys tallied in July 1992 indicate 80% use EEF. Since these only represent lender-ordered ratings, which were 50% of ratings at this time, 50% × 80% = 40% EEF. Assumes that of the other 50% of ratings ordered by builders and other sellers, 40% were used for EEF (50% × 40% = 20%); thus, 40% + 20% = 60% used as EEF.

[b]Assumes that 90% of market ratings ordered outside of utility programs were used for EEF.

[c]Assumes that 25% of utility ratings were used in EEF based on anecdotal evidence.

[d]Of the 427 ratings done in 1995, 202 were for the baseline survey of already-constructed homes. Therefore, 225 (427-202) as the basis for the number of loans (57% × 225 = 128).

Among the key professionals to reach with training and education are builders/contractors and real estate agents. Both groups have a vested interest in finding whatever marketing tool will set them apart from their competition. Offering energy-efficiency (and lower utility bills) is one such tool, whether it is a new home or a resale. Lenders, in turn, want to keep the agents and contractors as their clients, and so will be more willing to help put together a financing package. Energy Rated Homes of Vermont has employed a real estate professional on a part-time basis to focus attention on EEF products exclusively with the real estate community. Virginia, Alaska, and California have found that identifying specific agent-lender teams for intensive training results in highly visible role models. Once the success of these individuals become known, others quickly follow their lead. Because licensing requirements usually include taking a certain number of hours of continuing education coursework, a successful means of training in several states has been the development of accredited courses in the areas of HERS/EEMs.

Concurrent with training housing industry professionals is raising the level of awareness among home owners and buyers about the availability and value of ratings, whether they are upgrading an existing home, building a new one, or buying or selling a home. Common ways of reaching home owners are through home shows, special community meetings and seminars, and public information channels. All pilot states have at least one 800 number for access to information and have put considerable effort into publicity in newspapers, on television and radio, and in specialty publications. Many flyers have been produced for distribution, and several utilities have included information as bill stuffers.

Another professional group that needs training are appraisers and multiple listings service (MLS) companies. The focus

Table 4. *Funding for Portions of Rating Activities in the HUD/FHA Pilot States, 1993/1995*

Funding Source	Alaska[a]	Arkansas[b]	California[c]	Vermont[d]	Virginia[e]
State energy office	1,800,000	170,500	—	34,250	225,000
Utilities	—	—	1,742,900	NA	100,000
DOE	135,000	130,000	270,000	130,000	275,000
NREL	10,000	10,000	10,000	10,000	10,000
Ratings/dues/sales	550,000	—	388,600	148,500	45,000
State funds	6,000,000[f]	—	200,000	175,000	70,000
In-house	—	—	165,000	30,900	—
Other	—	68,300	228,000	27,250	15,000
TOTAL	$8,495,000	$378,800	$3,004,500	$555,900	$740,000

[a]Includes Alaska Housing Finance Corporation, Energy Rates Homes of Alaska Program, Energy Rated Homes of Alaska, Inc., and Alaska Craftsman Home Program, Inc.
[b]Energy Rated Homes of Arkansas only
[c]California Home Energy Efficiency Rating System, Inc., and California Energy Commission only.
[d]Energy Rated Homes of Vermont; funds from utilities included with ratings
[e]Virginia Home Energy Rating Organization only.
[f]Alaska Housing Finance Corporation rebates and loans linked to ratings.

Table 5. *Ratings Completed in the HUD/FHA Pilot States as of December 31, 1995*

State/Rating System	Number of Ratings	Time Period Covered
Alaska	11,283	1991–1995
Arkansas	940	1988–1995
California		
CHEERS	15,270	1993–1995
Energy Plus	275	March 1994–1995
Vermont	2,559	1988–1995
Virginia	7,635	1993–1995
TOTAL	37,962	

Table 6. *Raters in the HUD/FHA Pilot States as of December 31, 1995*

State/Rating System	Number of Raters
Alaska	35
Arkansas	200
California	
CHEERS	80
Energy Plus	2
Vermont	16
Virginia	78
TOTAL	411

Table 7. *Housing Industry Professionals Trained in the HUD/FHA Pilot States, 1993/1995*

Professionals trained	Alaska	Arkansas	California	Vermont	Virginia
Real estate agents	450 of 2,200	971	2,650 of 100,000	1,001	7,000 of 28,000
Lenders	150 from 35 institutions	103	450 of 70,000	446	960
Appraisers	6 of 80	—	NA	252	50
Builders/contractors	400 of 1,000	95	200	75	150 of 500
Population 1994[a]	500,000	2,450,000	31,000,000	580,000	6,552,000

[a]*Source: Statistical Abstract of the United States, 1995*

of their training and education needs to be on developing databases that keep comparable housing values as rated homes come on the market so that the value of energy-efficiency improvements can be documented. This, combined with tracking EEM default rates on these homes, can help build the case for lenders that such loans are no more risky than conventional loans. Perhaps the state that is experiencing the most progress to date in involving appraisers and MLS companies is Alaska, possibly due to the aggregation of housing in Anchorage, Juneau, and Fairbanks. The five MLS companies in the state (to be consolidated into one by 1997) list the star rating in many of their ads, and builders of new construction use either the rating or ACHP certification as an advertising tool.

OPERATION OF PILOT STATE PROGRAMS

The pilot state operations are important in understanding the development of HERS provider organizations and their approaches to linking rating outputs and other services with systems of financing energy efficiency as part of real estate transactions.

Alaska

The Energy Rated Homes of Alaska Program is the oldest statewide operating home energy rating system in the nation. Participating organizations include: the Alaska Housing Finance Corporation (AHFC), which includes the Energy Rated Homes of Alaska Program (ERHAP) and the Alaska Craftsman Homes Program, Inc. (ACHP), the HUD/FHA Field Office in Anchorage, and the Appraisal Institute of Alaska. Many other housing, lending, and consumer associations are involved in HERS/EEMs activities through these organizations, and private sector lenders and realty agencies offer varying types of incentives.

In 1984, the SEO provided $10,000 to modify a rating system developed for the Northwest, adapting it for Alaska's climates. In 1986 the rating system was in place. Ironically, the rating system was completed just as Alaska entered an economic depression that affected the housing market. In 1989 the market began to recover and the SEO began giving grants from oil overcharge settlement funds to market the rating system and support formation of ACHP in preparation for AHFC's plans to offer loans and rebates to install energy-efficiency measures (based on ratings) in 1990. ACHP also began training builders in constructing what are ACHP homes, rated as 5★+. Thus the rating system incorporated ACHP certification. With the rating system in place, it was relatively simple—when state building standards became more stringent in 1995—to move the rating associated with the standards from 4★ to 4★+.

The focus of the Alaska program through 1995 has been on rating new homes and convincing builders to build to the highest standards possible. Now that 83% of new homes are being rated, the focus can shift to rating existing homes and to difficult-to-reach rural areas. This means activities directed toward real estate agents, lenders, underwriters, and appraisers will be stepped up, with the goal of convincing them that energy efficiency adds permanent value to a home, and can be calculated in the same manner as, say, an additional bedroom or bath.

Arkansas

The Arkansas Energy Office (AEO) was instrumental in formulating the concept of a third party, non-profit organiza-

tion to conduct residential energy-efficiency ratings. The recognition of this role led to the establishment of Energy Rated Homes of Arkansas (ERH-AR) in 1986, with which Energy Rated Homes of America became co-mingled organizationally until January 1994. The AEO maintains a close connection with ERH-AR (although it is no longer a source of funding support for the organization) through legislation enabling an energy mortgage program in Arkansas.

The AEO and ERH-AR have identified and are directing efforts to address barriers to more effective implementation. Among these efforts are (1) providing education about HERS/EEF for stakeholders (lenders, real estate professionals, trade associations, and appraisers), (2) providing energy education for the construction trades, (3) developing consistency in funding for the rating organization, (4) coordinating with FHA, based on experience in the pilot program, and (5) making a concerted effort to form effective working relationships with partners including the FHA Field Office, Entergy (a large utility company), and the Arkansas Mortgage Bankers Association.

California

California organizations that have participated in HERS/EEMs activities include the California Home Energy Efficiency Rating System, Inc. (CHEERS); Energy Plus, Inc.; the California Energy Commission (CEC); the five HUD/FHA field offices; Pacific Gas & Electric Company (PG&E); Southern California Edison (SCE); and other utilities. Many other housing, lending, and consumer associations are involved in HERS/EEMs activities through contracts with CEC, and private sector lenders and realty agencies offer their own incentives.

The CEC initiated development of an acceptable rating tool and system in the early 1980s, field tested it, contracted for further development and research on HERS in the late 1980s, became responsible through state legislation for issuing HERS guidelines and oversight of the HERS industry in the early 1990s, and is implementing a state-mandated and funded marketing, training, and consumer information program. The State's energy-efficiency building performance standards exceed CABO-MEC '92.

With the support of the CEC, a consortium of California utilities formed CHEERS (a public/private partnership) for the purpose of developing and testing a rating tool and system that would be used in conjunction with their demand-side programs and incentives. Once field-testing was completed in mid-1994, CHEERS began the difficult transition toward becoming self-sufficient by the end of 1996. This includes developing a market for ratings that goes far beyond HUD EEMs and utility rebates (which have been largely phased out in response to deregulation of the electric utilities in California), training raters on behalf of other states, and expanding operations beyond California.

California is unique (at this time) in that a second organization (a private company) also offers ratings in the state. The two raters who own Energy Plus, Inc., which began operating in March 1994, were trained by CHEERS and concluded that a viable business opportunity existed in the Central Valley. Their approach is totally market-based. Working with EEM brokers and spending considerable time in one-on-one meetings with lenders and real estate agents, they focus on rating homes that have a high probability of obtaining HUD EEMs.

Vermont

Energy-efficiency financing linked with energy ratings in Vermont began in 1986 with the allocation of $500,000 in Petroleum Violation Escrow (PVE) funds to the Vermont Housing Finance Agency (VHFA) by the state legislature, through the Vermont Department of Public Service (DPS). The VHFA organized a team of energy professionals to explore a program design and form two advisory committees representing stakeholder groups. The outcome was the formation of Energy Rated Homes of Vermont (ERH-VT) in 1987. In the beginning, rating services were offered without charge. In 1989, the organization commenced a fee-for-service policy and a membership dues structure to support its activities when the PVE funds became exhausted. In 1993, ERH-VT increased active promotion of EEMs as one of the five FHA pilot states. At the same time, the organization was involved in promoting the DVA and Fannie Mae EEF products. In 1994, rating activity further increased with contracts from major utilities in the state, in conjunction with DSM programs implemented with DPS oversight.

ERH-VT maintains strong ties with DPS and VHFA. Maintaining and enhancing partnerships with stakeholder groups (lenders, real estate professionals, appraisers, builders/contractors) is a critical aspect of ERH-VT's outreach work. Finding ways to enhance the involvement of real estate professionals remains the most challenging component of work with Vermont stakeholders.

Seven EEF products are presently available in Vermont. In addition, four utility companies have incorporated energy-efficiency ratings in new construction programs. These products affect the housing market in Vermont for both existing and new construction. An examination of data on property transfers and housing starts suggests that the market for EEF can be exploited further; however, market research specific to EEF is required to fully understand its potential. In addition to general stakeholder issues, barriers to implementation exist in the financing process itself, and are best overcome by emphasizing appropriate incentives for stakeholders,

especially lenders. ERH-VT directs its strategic marketing efforts toward overcoming these barriers.

Virginia

The Virginia Department of Energy (DE) contracted with Energy Rated Homes of America in 1989 to develop a HERS program for Virginia. DE established a task force consisting of builders, real estate professionals, HVAC, solar and weatherization contractors, utility representatives, and home inspectors to provide oversight. DE decided that a nonprofit corporation, Energy Rated Homes of Virginia (ERHV), incorporated in July 1992, should be established to administer the program. A parallel nonprofit, the Virginia Home Energy Rating Organization (V-HERO) to train and certify raters, established in February 1993 in response to an IRS decision that a HERS provider did not qualify as a 501(c)(3), was intended to become self-supporting through rating and membership fees. In April, ERHV became the Virginia Residential Energy Foundation (VREF). As these organizations evolved, V-HERO emerged as the central nonprofit rating organization in Virginia and, in January 1995, VREF signed assets and liabilities to V-HERO and ceased to exist.

The Virginia program has been unique in its partnership and marketing activities. From the outset, the program directors stressed the importance of linking their efforts with those of other cognizant organization. V-HERO has formed partnerships at the national level with DOE, the Home Energy Rating Systems Council, the Alliance to Save Energy, the National Association of Home Builders, and the U.S. Environmental Protection Agency. V-HERO has formed financial partnerships with more than 45 lending institutions doing business in Virginia, as well as with Fannie Mae, in developing an EEM pilot program for the conventional housing market. In addition V-HERO has worked closely with utility companies in the state, including Virginia Power on its Energy Saver Four-Star Home and Energy Saver Plus Five-Star Home Programs, certifying homes for new construction that will qualify for EEF products. In addition, V-HERO has actively sought out relationships with members of the Appraiser Commission, the Virginia Association of REALTORS, the Virginia Association of Home Builders, and private energy firms providing ratings and energy services. V-HERO has used a multifaceted marketing strategy based on galvanizing the consumer demand its directors believed existed. The array of marketing techniques being used include network and cable television advertising, radio advertising, human interest articles in newspapers, stories in trade publications, public speaking, telephone calls, direct mailings of brochures, distribution of educational materials to schools, and direct advertising in real estate racks.

During 1995, V-HERO created a model for small-focus pilot programs aimed at saturating loans in small geographic markets for all types of borrowers, from those wishing to exceed their normal borrowing capabilities (such as FHA EEMs borrowers) to those wishing to borrow well below the amount for which they can qualify. V-HERO's ultimate goal is to become an organization that is financially self-sufficient, providing valued services to improve the energy efficiency of housing at all income levels.

PRELIMINARY FINDINGS

Some preliminary findings emerging from the 1995 process evaluation effort are summarized below.

- Considerable financial subsidies are required over fairly long periods of time before a HERS provider organization can become self-sustaining through the services it provides. Diversifying services may help HERS provider organizations become more self sufficient, although not all have this as a goal.

- Public/private partnerships are essential to building HERS provider organizations, which are usually not-for-profits. The home energy rating organizations at the state level are ''seedbeds'' for developing EEF products in partnership with utility companies, builders, and others in the real estate markets. Going beyond the implementation of the FHA EEMs pilot program, they have been instrumental in the creation of new loan products and an array of services to support energy-efficiency financing. Members of stakeholder groups—builders, real estate professionals, lenders, appraisers—must be involved in the process of developing a viable HERS/EEF linkage in a state or region.

- Although FHA EEMs were limited during the pilot period to existing homes, states have observed that a good way to gain visibility among builders and contractors is to focus on new homes. Energy-efficient construction practices implemented from the outset in building a home is more cost-effective than retrofitting. On the other hand, since most of the housing stock is already built, retrofitting is a necessity to achieve improved efficiency.

- One of the largest challenges HERS provider organizations have faced is ensuring a market for ratings by educating real estate professionals, developing other EEF products beyond the FHA EEMs, informing the public about the availability and value of ratings and EEF, and making certain that raters are trained and certified in marketing and EEF lending, as well as the technical aspects of ratings.

- The involvement of electric utilities varies over space and time, has fostered the use of rating tools and EEF

activity, depending on the level of DSM programs and, recently, the emergence of restructuring in the marketplace which has led to the demise of many DSM activities.

- Movement toward coordinated activities at the national level has occurred on the part of the pilot states' HERS provider organizations. In particular, they have sought to develop a market for purchasing EEMs by large mortgage servers. This includes HERS provider organizations looking to extend their services beyond state boundaries and, conversely, organizations focusing intensely on limited geographic areas to maximize efforts. The latter has led to another problem, however, in that rural areas are greatly underserved.

The linkage of ratings with energy-efficiency financing, although proceeding slowly appears to be on the way toward becoming institutionalized in the United States. A number of problems, such as accreditation of rating systems and the default rates of energy efficient loans, remain to be resolved. Nevertheless, the programs are being created, implemented, and used; data are being collected on their results. Many answers are still to come.

ENDNOTE

This paper is a presentation of primary data rather than a review of literature. For the interested reader, however, we offer a few sample citations: Luboff, J., 1995, ''Making Energy Mortgages Work,'' *Home Energy* 12(3): 27–33; Faesy, R., 1992, *Lessons Learned from Four Years of Operating a Home Energy Rating System and Energy Efficient Mortgage Program*, Burlington, Ver.: Energy Rated Homes of Vermont; Braunstein, L., 1992, ''Energy Efficient Mortgages: A Utility Perspective,'' *Public Utilities Fortnightly*; Cutter Information Corporation, 1993, ''New York State Offers $4,000 per House to Energy-Efficient Home Builders,'' *Energy Design Update* 13(4): 1; and Mortgage Bankers Association, 1992, ''Task Force Proposes National Energy-Efficient Mortgage Program,'' *MBA StateLines* 5(7): 1.

REFERENCES

Collins, N., Farhar, B., Babiuch, W., and Eckert, J. 1994. *A Plan for Evaluating Alternative Approaches to Financing Energy Improvements in Housing (Final Draft)*, NREL/TP-461-6688. Golden, Colo.: National Renewable Energy Laboratory.

Farhar, B., and Eckert, J. 1993. *Energy Efficient Mortgages and Home Energy Rating Systems: A Report on the Nation's Progress*, NREL/TP-461-5478. Golden, Colo: National Renewable Energy Laboratory.