

The Critical Role of State Housing Finance Agencies in Promoting Energy Efficiency in Buildings

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It is the goal of state housing finance agencies to assist low- and moderate-income people to meet their housing finance needs. While many factors which affect long-term housing affordability such as interest rates and land prices remain out of control, energy consumption (and therefore energy cost) is a factor which is possible to control. State housing finance agencies, as mortgage holders for a large portion of housing and developers of mortgage programs, can influence the affordability of a significant portion of a state's new and existing housing stock through energy efficiency.

To illustrate this potential, this paper describes the innovative energy-related initiatives of the Vermont Housing Finance Agency, which have been developed in partnership with a non-profit energy service organization, private developers and government programs.

Vermont's Experience

The Vermont Housing Finance Agency (VHFA) was created in 1974 to address the shortage of mortgage capital in Vermont. Since its inception, VHFA has financed more than 15,000 home loans and nearly 3,200 affordable apartments through the issuance of over \$800 million in bonds.

Every state, as well as the District of Columbia, Puerto Rico and the Virgin Islands, has a housing finance agency (HFA) similar to VHFA. They were created by their respective legislative bodies to raise capital and direct that capital to promote affordable housing opportunities for low- and moderate-income people. HFAs raise their capital through the sale of both tax-exempt and taxable bonds. Collectively, they operate over 600 affordable housing programs which include a wide variety of home ownership programs, homeless initiatives, and the financing of over 900,000 units of low- and moderate-income rental housing throughout the United States.

HFAs have little control over the major factors which affect housing costs, such as the cost of capital, land prices, and construction costs. Energy cost is unique because it is one factor which can be controlled. As mortgage holders, HFAs can influence the affordability of a significant portion of a state's new and existing housing stock through initiatives which promote energy efficiency.

VHFA recognized that reducing this link between energy use and long-term affordability and began early to promote this concept through its mortgage lending guidelines in two distinct ways. First, as early as 1976, VHFA

required that all multi-unit housing (apartments) financed by VHFA meet rigorous energy efficiency standards which greatly exceeded the prevailing standards of the time. Second, in originating single-family mortgage loans, VHFA recognized that sound loan underwriting should include some accounting for the energy expense of the residence being purchased. Typical underwriting ratios used to qualify potential buyers require that no more than 28% of the family's income go to supporting the mortgage payment (principal, interest, taxes, and insurance), with no allowance made for energy costs. VHFA added the cost of heating and increased this ratio to 33%, favoring any buyer purchasing an energy-efficient home.

Then in 1986, VHFA began what became an unprecedented range of energy efficiency initiatives for an HFA. These addressed energy efficiency in all types of Vermont's housing stock where VHFA played a role, including multi-unit rental housing, energy improvement loans, energy efficient mortgages, new construction and major rehabilitation, and public housing, each of which is described in detail in subsequent sections of this paper.

An important aspect of VHFA's ability to implement these initiatives was the partnership which was developed between VHFA and the non-profit Vermont Energy Investment Corporation (VEIC). In 1986, VHFA and individuals from a number of other public and non-profit organizations, all of whom had need for a wide range of expert, independent, high-quality and comprehensive energy services in Vermont, formed VEIC to provide those services on a statewide basis. Since that time, VEIC

has developed broad program development and delivery capabilities, grown to a staff of ten, and has played a key role in all of VHFA's energy efficiency initiatives.

Energy Efficiency Initiatives of the Vermont Housing Finance Agency

Since 1986, VHFA has developed a number of innovative energy efficiency initiatives, working with VEIC, private (non-profit and for-profit) housing developers, and state and municipal governments. These initiatives, described below, are illustrative of the kinds of programs which can be undertaken by HFAs.

Multi-Unit Rental Housing Energy Efficiency Program

The VHFA is the mortgage holder for one hundred multi-unit housing developments (comprised of 3,366 rental units) throughout Vermont, many of which are federally subsidized through the Section 8 program of the U.S. Department of Housing and Urban Development (HUD). Most of these projects were built (or underwent major rehabilitation) in the late 1970's. As a reaction to the "oil crisis" and because most of Vermont does not have access to natural gas, many of these developments were built with electric space heat, particularly storage heat, which was being promoted at the time through a favorable rate structure. Now, with different rate structures and uniformly higher rates, most of these projects find themselves with high energy costs.

In 1987 and 1990, VHFA launched programs to actively encourage the owners of these Section 8 properties to make energy improvements to their developments. VHFA identified the projects with the highest per-unit energy costs and suggested to the owners that energy improvements would be a good investment.

VHFA identified organizational partners who had the ability to offer comprehensive energy services, or "one-stop shopping", a feature seen as critical to project implementation. These energy service organizations offered a full range of services to the property owners, including building energy analysis, cost estimates for the proposed energy improvements, cash flow analysis as a result of the improvements, construction management for the installation of improvements, including preparation of work specifications, bid preparation, contractor selection and oversight, and final inspection. VEIC is VHFA's primary partner in providing such services under this program.

The financing for the energy improvements came from a variety of sources, the primary source being the Project Cost Escrow funds. At the time of initial mortgage financing, VHFA placed a stipulation on the mortgage that required the owner to establish an escrow fund, which was set as a percentage of the project cost, called the Project Cost Escrow (PCE). VHFA maintains joint control with the owners over how these funds may be spent. VHFA's intention was that these PCE funds would be used between the seventh and twelfth years after construction or major rehabilitation for necessary repairs and/or project enhancements. Although the available amount of the PCE funds varies from project to project, the average amount is approximately \$1,200 per unit.

If funds beyond the available PCE funds are required, a variety of additional sources can be used. The project owner, VHFA, and in some cases HUD, also jointly control an account containing the project's surplus operating cash (residual receipts) which is the project's excess income above expenses. VHFA has encouraged owners to use these funds to help pay for the energy improvements, as the post-improvement energy savings generally far exceed the interest generated by the funds.

VHFA has also received HUD's approval to refinance housing developments which carry high interest rates from the early 1980's and use the interest savings to reduce the monthly debt service. The increased cash flow resulting from this restructuring of debt is available for financing heating system conversions and other energy improvements which will ultimately reduce the operating expenses for the developments.

Alternately, project owners could use the cash flow analysis accompanying the energy analysis to secure financing from private lenders. Finally, VHFA can provide its own capital for the improvements if the owner is unable to find financing elsewhere.

As a further incentive to encourage property owners to make cost-effective energy improvements, VHFA offered to recognize the cost of these improvements as a basis for increasing the owners' equity position in the project.

Energy analyses have been conducted at 25 of the developments with the highest energy use, and energy improvements have been completed or are underway at half of the analyzed developments to date. Following are descriptions of three of these projects.

An energy analysis of an 16-unit apartment complex in Bristol, Vermont indicated that simple mechanical room

retrofits of a "front-end" high-efficiency boiler and a 90% efficient propane-fired commercial water heater, together with individual apartment thermostat upgrades, would make it easier for the elderly tenants to control apartment temperature. First-year savings were approximately \$2,650 for an investment of \$15,600 of PCE funds, resulting in a simple payback of just under six years.

A senior citizen housing complex in St. Albans, Vermont is comprised of two residential buildings with a total of 32 apartments, a converted former synagogue which houses the owner's offices, a greenhouse and a community room for all residents. Through comprehensive on-site inspection and billing analysis, it was determined that a number of cost-effective energy efficiency investment opportunities existed, including fuel switching of the space and water heating from electric storage heat to natural gas, insulation upgrades, air sealing and water conservation measures. The \$80,000 investment was made with PCE funds. The net first-year energy savings are anticipated to be \$13,000, providing a simple payback of a little over six years.

In Enosburg Falls, a 30-unit senior citizen project with electric heat was located next to a 20-bedroom community care home. By tying the two projects together with underground hot water piping, adequate load was created to support the installation of a 30-kW propane-fired cogeneration system to provide most of the heat and hot water to both facilities. The owner was offered a shared-savings financing arrangement by VEIC. This offer by VEIC increased the owner's level of confidence that the savings would occur, and realizing that he could keep all of the savings if he paid for the improvements himself, he chose to make the entire investment himself. Thus far, this innovative system has saved the project owner over \$10,000 per year at an initial investment cost of approximately \$90,000.

In all of these examples, VHFA and VEIC worked together to encourage the property owners to take the initial step of getting an energy analysis, and more significantly, to take the next steps to actually making the energy improvements.

Home Energy Improvement Loans

Vermont's existing housing stock is generally old and energy inefficient. The percentage of income needed to pay energy bills is higher for low- and moderate-income people. High energy bills can pose a threat to people who own their own homes, particularly those on fixed incomes. As a mortgage lender, VHFA recognizes that an

energy-efficient home is a more secure mortgage because energy costs are lower.

Most low- and moderate-income people do not have the cash available to pay up front for energy improvements. The major barriers to making energy improvements are the lack of capital, lack of reliable information about the best improvements to make, and in many cases, the lack of expertise to go through the process of getting the work done reliably and effectively.

VHFA and VEIC identified a need for a program which would include attractive financing and the availability of comprehensive "one-stop shopping" audit and installation services. Together they developed the "Home Energy Improvement Loan Program" in 1986. The program was designed on the basis that energy improvements can be financed out of energy savings; in other words, the loan's debt service would be offset by the energy savings.

The monthly loan payment for these relatively small loans is more sensitive to the term of the loan than to the interest rate. Using funds which resulted from prepayment of older, lower-interest mortgages, VHFA has been able to allow loan terms of up to ten years, and keep the interest rates in the single-digit range (between 7% and 9.75%).

The underwriting procedure used in the program is based on a household's total income and debt, including energy costs. This allows for a debt-to-income ratio that is higher than conventional underwriting guidelines. That is, it allows the post-improvement energy savings to be credited to the "income" side of the debt-to-income ratio when determining the eligibility for financing.

While this sounds simple, it is not the traditional way in which loans are underwritten, and therefore, these flexible guidelines expand the program to make loans to homeowners who ordinarily would not be eligible for conventional financing. The innovative underwriting in this program requires an accurate estimate of the post-improvement energy costs, since the homeowners' ability to repay the loan is based on achieving the expected savings. VHFA's partnership with VEIC provides the program with the energy expertise required for such underwriting.

Operationally, VEIC acts as the agent of VHFA in this program, just as banks do for VHFA mortgage funds. VEIC underwrites the loan, provides the required energy analysis, secures the loan guarantee and performs the loan closing. VHFA services the loan.

VEIC estimates the post-improvement energy savings based on an analysis of the current energy bills and a description of the home and its energy end uses. If a borrower is not sure what would be the best package of energy improvements to make, or if the savings from the energy improvement package cannot be accurately estimated off-site, VEIC will perform an on-site energy analysis.

Any energy improvement which is cost-effective over the life of the improvement is eligible for financing. Loans have been made primarily for heating system upgrades, replacements and conversions and thermal envelope improvements. The amount of improvement packages range from \$1,000 to \$7,500, and averages \$4,300.

All loans made through this program are secured by the Vermont Home Mortgage Guarantee Board, which provides 90% coverage of the loan and significantly reduces the risk to participating lenders, including the VHFA. The cost of this guarantee is 2% of the total loan amount, which is also paid by the borrower. These energy loans represent a secure investment for VHFA; the loan default rate over the life of the program is a low 0.8%.

An important feature of this program is that the borrower is not required to make any up-front cash investment. Both the loan guarantee and loan origination fees may be financed as part of the loan. If an energy analysis is performed, the fee for this service may also be financed, and VEIC delays billing the client until after the loan is closed.

VHFA directly provides low-interest long-term loan capital to the program and has identified other sources of loan capital for the program as well. Currently, two conventional banks, a newly-formed local credit union and VHFA all contribute loan capital to the program. Since 1986, the program has loaned \$580,000 to low- and moderate-income Vermont homeowners.

Additionally, the VHFA has provided operational support for the program in the form of a per loan fee to VEIC. VEIC secured supplemental operating funds for the program from the State of Vermont's Department of Public Service, which provided an oil overcharge grant to VEIC. At this time, VEIC is currently pursuing the potential for making the operation of the program self-sufficient by securing very low interest-rate capital, which can be blended with capital from VHFA and other sources, and loaned to borrowers at a slightly higher interest rate than the actual average.

Marketing of the program is primarily the responsibility of VEIC. The VHFA has played a major role by contributing

to the marketing costs and sponsoring a mailing every year to all of its mortgage holders, encouraging them to consider making energy improvements and offering financing through the program.

Energy Efficient Mortgages

The time of sale offers a unique window of opportunity for upgrading a home's energy efficiency. If the cost of the energy efficiency improvements can be financed as part of the mortgage, over the typical twenty-five to thirty year-term, relatively high investments in high levels of energy efficiency will be economic and result in increased net housing affordability.

In order to integrate energy efficiency into the mortgage lending process, two key elements are combined - a uniform home energy rating system and an "energy efficient mortgage" process. A uniform home energy rating system is necessary to ensure that mortgage lenders have a standard, fair and reliable basis for assessing the current energy efficiency of a home and its associated energy costs. If the home is less than an established energy efficiency standard, the rating provides an estimate of the cost to make it energy efficient and an estimate of the post-improvement energy costs.

An Energy Efficient Mortgage uses the rating of "energy efficient" to qualify a borrower with a higher debt-to-income ratio than normal, because it recognizes that the borrower will have more money available for monthly mortgage payments since the energy bills will be lower than the "average" assumed in conventional mortgage underwriting. If a home is not rated "energy efficient", the amount required to make it energy efficient can be included in the mortgage amount and the same stretched qualifying ratios can be used in underwriting. The funds for energy improvements can be set aside in an escrow account and the home buyer can make the improvements within a specified time after purchase. In this way, the home energy rating and the energy efficient mortgage process can be applied to both new and existing construction.

The Energy Efficient Mortgage makes home ownership more accessible as well as more affordable. For example, if a \$100,000 house was not rated as energy efficient, the buyers of that home would typically need to have an annual income of \$43,849 to qualify for a \$90,000 mortgage (assuming a 10% down payment and a 30-year term). If that same home were rated as energy efficient, the buyers would need an annual income of \$40,926 to qualify for the same mortgage.

Looked at another way, if a household with an annual income of \$40,000 wants to buy a home, they would typically qualify for a \$80,715 mortgage if the home they were buying was not energy efficient. If that same household were buying an energy efficient home, they would be able to qualify for a mortgage of \$88,312.

Another way to express the impact of the energy efficient mortgage on affordability is that the increased qualifying ratio affects the underwriting to the same extent as a decrease of 1.50% in the mortgage interest rate.

In 1987, the State of Vermont allocated a portion of its Exxon oil overcharge funds to the development of a home energy rating system and an energy efficient mortgage program. Recognizing that credibility and familiarity with the banking industry were critical elements required to get this effort off the ground, VHFA was selected as the organization to implement the project. VHFA has an established, working relationship with all of the banks in Vermont, as well as with the secondary mortgage market. With technical support from VEIC, VHFA began the long process of trying to introduce a fundamentally new concept to Vermont's building industry. A new non-profit corporation, Energy Rated Homes of Vermont, was created to be the vehicle for delivering the home energy ratings and to promote the energy efficient mortgage process. Energy Rated Homes of Vermont (ERHVT) and the Energy Efficient Mortgage have been operational since 1988. Over 1,300 home energy ratings have been performed, resulting in over 600 Energy Efficient Mortgages. Fifteen lenders, whose mortgages constitute approximately 80% of the mortgages originated in the state, participate in the program. While other states have implemented a range of similar home energy rating systems, none to date have established as functional a link between these ratings and the mortgage lending process.

In addition to taking the lead role in developing ERHVT and the Energy Efficient Mortgage throughout the state, VHFA initiated changes from within as well. VHFA altered its underwriting ratio to favor energy-efficient homes, because the ERHVT rating system provided a uniform and accurate measurement tool. VHFA decided to use a 33% debt-to-income ratio (including heat) for those homes that were rated 4 STARS (based on a scale from one to five stars) or more using the ERH system.

The barriers to the widespread use of the Energy Efficient Mortgage are the added cost and paperwork as well as the perceived potential for slowing down the home buying process. A promising method for overcoming these barriers may be the offer of a lower interest rate if the home is--or will be made--energy efficient. VHFA is

currently pursuing the possibility of developing such an incentive-based mortgage program.

Energy Efficiency in Affordable New Construction and Major Rehabilitation Projects

The best time to make housing energy efficient is at the time of initial design and construction or major renovation. The two major barriers to incorporating energy efficiency into new construction or major renovation are first cost and timing. When a new housing project is under development, resources are usually tight, forcing the developers to look for ways to lower construction costs and speed up the construction process. Even when the value of energy efficiency is recognized, the development(?) and financing process places so much emphasis on initial construction cost that energy enhancements often get sacrificed as "extras".

VHFA provides part or all of the mortgage funding for the majority of the affordable housing developed in Vermont through its regular financing programs, and is committed to making cost-effective investments in energy efficiency. The example that VHFA sets in considering energy efficiency serves a model for other funding sources in the state.

In addition, VHFA has used the Federal Low Income Housing Tax Credit program to implement major energy improvements at several properties in Vermont. The ten-year rehabilitation business investment tax credits available through this program provide additional benefits to owners who are able to increase their net cash flow by pursuing energy efficiency measures which improve the project's overall operating efficiency.

VHFA encourages developers (or even requires them in some programs) to obtain energy design assistance, at the earliest possible stage, by either linking the developers with energy efficiency design service professionals or by directly providing such energy efficiency design services.

One illustration of the important role that energy efficiency plays in the successful financing of a major rehabilitation project is that of Northgate Apartments in Burlington. Northgate is a complex of 336 apartments, built by a private owner in 1970, under a federal government arrangement whereby the apartments had to be rented to low- and moderate-income people for a twenty-year period. When a non-profit organization was formed in 1989 to purchase the Northgate project and preserve it as perpetually-affordable housing, VHFA played a pivotal

role in seeing that aggressive levels of energy improvements were incorporated into this extensive renovation. Energy investment opportunities were analyzed by VEIC and their cost were included in the project financing. Major energy upgrades were combined with re-siding and re-roofing, and electric heat and hot water were replaced with integrated, sealed-combustion high-efficiency gas systems with hydronic distribution. The average per apartment cost for the energy improvements was \$6,250. The average annual per apartment energy savings are \$617, representing tenant cost savings of 48% after renovations were completed.

Another successful major renovation project recently undertaken by VHFA was at Fort Ethan Allen, a development of nineteen historic buildings (77 housing units) which formerly housed military officers. VHFA's objective in taking on the project was to prove that large old historic buildings could be adapted into affordable housing in lieu of upscale condominiums. One major concern was the potential cost of heating the renovated housing, due to the limitations placed on the renovation by the historic nature of the buildings. Working with ERHVT early in the design process enabled the project to achieve a 4 STAR energy ratings by installing insulation, storm windows and very efficient heating equipment, and reducing air infiltration. The annual energy costs are expected to be \$1,139 for a typical unit, or a 47% reduction compared to pre-improvement in energy costs.

Financing of Energy Efficiency Improvements in Public Housing

Much of Vermont's public housing was built in the 1970's and has electric space heat. Vermont's winter electric rates are high, typically in the range of \$0.12 per kWh, making electricity a very expensive way to heat buildings. Until recently, the only way in which a public housing authority (PHA) could improve its properties (including switching from electric heat to other heating sources) was by receiving rehabilitation funds directly from HUD. In the last few years, however, HUD has developed a waiver mechanism which allows PHAs to keep the savings resulting from those energy investments made without using HUD funds. When combined with VHFA's innovative financing, this process has opened the door for PHAs to make major building energy efficiency improvements.

Innovative financing arrangements have been utilized twice in Vermont to make energy improvements to public housing. In both cases, VHFA provided the capital to the non-profit VEIC, which used the funds to purchase and install energy improvements. Both PHAs obtained waivers from HUD which allowed them to receive the equivalent

of the pre-improvement energy costs for a period of ten years. Each PHA then entered into a long-term service contract with VEIC, and pays VEIC a portion of the energy savings which result from the improvements. VEIC then uses those funds to maintain the system and make its loan payments to VHFA.

For a 160-apartment high-rise development for the elderly in downtown Burlington owned by the Burlington Housing Authority, VHFA provided a loan to VEIC which was used to develop and install a 60-kW cogeneration module to replace all of the electric water heaters for the building, offset some of the space heating load in the building and meet 60 kW of the electrical load of the building. The project cost was approximately \$110,000. The housing authority saves an average of \$25,000 annually. Approximately 70% of the savings are paid to VEIC which cover VEIC's debt service, operation and maintenance costs. The housing authority invests the balance of the savings in additional building energy improvements. VHFA has made a secure investment; VEIC is covering its costs; the housing authority is continuing to lower its energy bills and retain a portion of the savings; and at the end of the ten-year term of this agreement, HUD will have a much lower energy bill to pay than if the project had not been undertaken.

A similar process was used to finance a wood chip-fired central boiler facility which provides heat and hot water to a 50-apartment family housing development in Barre, Vermont. VHFA loaned the funds to VEIC, which purchased and installed the system. VEIC is being paid a monthly fee out of savings which accrue to the Barre Housing Authority, which covers the debt service and the fuel, maintenance and project management costs. The system became operational in February of 1992, and is expected to achieve energy cost savings of 85% over the original electric space and water heating costs.

These are simple arrangements, but, similar to energy loan underwriting and energy efficient mortgages, they would have been much more difficult to actualize without VHFA's ability to invest in energy efficiency improvements based on future savings. More conventional lenders have neither the established underwriting procedures to account for future savings, nor the knowledge to judge whether such savings are in fact likely to occur.

Conclusions

The Vermont Housing Finance Agency has demonstrated how state housing finance agencies can influence the long-term affordability of a significant portion of a state's new

and existing housing stock through innovative energy efficiency initiatives. The success of these initiatives is based upon:

- recognition of the critical link between energy efficiency and housing affordability;
 - creative use of a housing finance agency's bonding capabilities to generate capital for energy efficiency investments;
 - implementation of innovative underwriting criteria which recognize future energy cost savings when qualifying borrowers; and
- developing a creative partnership with a full-service, non-profit energy service organization with the specific technical expertise and organizational capabilities required to implement these types of programs.

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