

Improving The Affordability Of Property Mitigation: Innovative Ideas From The Energy Sector¹

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Introduction

Hardening or mitigation of homes is a valuable tool that can be utilized to lessen damages resulting from natural catastrophic events. It is well established that the promotion of home mitigation and hardening against windstorms and other potentially catastrophic perils is beneficial to citizens, homeowners, businesses and government.² The continued recession in the US economy, the reduction in housing values, along with the impact of past and potential future windstorms have placed pressure on the finances of residential property owners.³ These combined economic impacts provide an especially ripe environment for the success of innovative financial policies that can substantially reduce the perceived costs of engaging in mitigating behavior.

Because of the upfront costs associated with the implementation of mitigation techniques as well as other barriers, consideration of financing programs that can help curb the personal costs of mitigation and home hardening is critical. Incentives often used to promote mitigation to homeowners include tax credits, premium credits, and mitigation grants, bonds and loans. Currently, and presumably into the near future, there are severe limitations to state and federal monies that may be used to fund home hardening. While the present financial situation places pressure back onto local governments and property owners to mitigate local disasters, the pressure also creates the opportunity to set mitigation incentives locally and thus ensure that every property owner impacted by a disaster has substantial “skin in the game.”

This paper evaluates **local** financing programs that may be useful to compel residential property owners and developers to make voluntary disaster mitigation expenditures. These hypothetical public financial incentives programs aimed at home hardening improvements are referred to here as Voluntary Home Hardening Bonds (VHHBs) and Voluntary Home Hardening Loans (VHHLs). Both types of these proposed programs provide financing (as opposed to simple credits or grants) to property owners for home-hardening improvements, with terms comparatively favorable to conventional loans. Thus, they provide a financial path to increase the affordability of mitigation along with a continued incentive for participating property owners to protect against loss after making the expenditure. The local nature of these strategies allows local governments to each design their own funding mechanism(s) for promoting selected mitigation measures that make optimal sense for their respective communities. Financing programs already exist that can serve as models for local governments to incentivize homeowners to harden their properties. Voluntary Environmental Improvement Bonds (VEIBs) are the best known of such programs. States (Florida, for example) may be friendly environments for such programs to develop and succeed without much, if any, change to State Legislation. No material difference appears to exist between legislation necessary for VEIBs (financing programs for property “greening” and energy improvements), or similar strategies, and for VHHBs or VHHLs (financing programs for property mitigation improvements and home hardening).

Abstract

The benefits of property hazard mitigation — both in terms of reduced loss damages and insurance premium savings — have been well established, particularly in catastrophe-prone regions of the US. Upfront costs associated with the implementation of mitigation techniques, however, hinder the promotion of residential property hazard mitigation. Consideration of financing strategies that can help curb the personal costs of mitigation and home hardening is critical. This paper advances locally-designed and managed programs to encourage residential property owners to engage in mitigation measures that are most effective in their respective communities. These local financing programs — referred to broadly by the author as Voluntary Home Hardening Bonds (VHHBs) and Voluntary Home Hardening Loans (VHHLs) — can be achieved in multiple ways, one of which mimics the programs that have been implemented successfully in several states to promote energy improvements in various parts of the country. Further, this paper sheds light on recent and current events impacting the ease of program planning and implementation, focusing on how optimal design can overcome economic and legal obstacles.

The first section of this paper reviews the literature and discusses the challenges of trying to incentivize property owners, particularly homeowners, to mitigate properties against disasters, and identifies and evaluates the feasibility of model programs for local mitigation financing that are used already to incentivize green (renewable energy) home improvements. The paper then analyzes how to design a local mitigation financing program, with emphasis on the program's structural components.

Evidence of an Affordability Problem

Studies regarding the social and economic effects of mitigation have consistently found that mitigation can result in both public and private good. Despite the value that mitigation provides, it still is difficult to persuade many homeowners to invest in home improvements that increase the protection against damage from disasters for several reasons, of which the most difficult to fix is the perceived lack of affordability.

Policy and industry studies have indicated again and again that cost is the primary reason property owners provide for why they do not engage in home hardening. Cost is ranked even higher as a constraint among minorities and low-income homeowners, who unfortunately are also more likely to own properties in the most need of hardening (Peacock, 2003; International Hurricane Research Center, 2004).

Many loss-reducing mitigation techniques are associated with high up-front costs that may be financially prohibitive, especially for lower-income property owners. Without access to long-term, cost-effective financing arrangements, many homeowners may not seriously consider making the expenditure. In 1992, Kunreuther and Kleffner found that using financial considerations alone, homeowners may not mitigate due to information asymmetry between costs and benefits. (The costs can be determined easily, but the future benefits may be ambiguous; thus the homeowner may overweigh the costs because they are known or underweigh the benefits because they are not known.) Later (2006), Kunreuther further found that individuals tend to make cost-benefit decisions regarding mitigation using a two or three year required payback period.⁴ Since insurance and/or loss savings from mitigation expenditures may be realized slowly over many years, such a decision rule may restrict homeowners from participating in home hardening unless the cost of mitigation measures can be delayed or amortized over many years as well.

The literature is sparse regarding how to optimally incentivize individuals and local governments to mitigate. Kelly and Kleffner (2003) assert that if governments were to subsidize mitigation, people would spend more on mitigation and less on insurance. Kleindorfer and Kunreuther (1999) submit that often, poorly constructed homes are owned by impoverished individuals or families who cannot afford mitigation or rebuilding costs. The government is likely to provide relief for these people after a large loss at an expense to the public, so it may be particularly desirable to subsidize the cost of mitigation for them. Incentives from the private sector, as well as the public sector, are worthwhile for consideration. For instance, financial institutions (banks) support mitigation if the mitigation decreases the probability of mortgage default due to property loss (Kunreuther, 2006).

Reducing the Affordability Barrier to Mitigation

Given the potential for barriers to mitigation, as well as relevant research findings, not all mitigation incentives are the same. Generally, public and private programs that do the following may be most successful in effecting widespread actual mitigation:

- Ensure that owners of insured properties still have significant financial stake in the event of catastrophe.
- Accurately set the risk (and mitigation)-based insurance premium.

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- Involve financial institutions in subsidizing mitigation costs to customers.
- Provide short-term (2-3 year) benefits or delayed costs associated with mitigation.
- Educate the individual regarding true hurricane risk and the cost of insurance.
- Provide feedback on mitigation participation by neighborhood.
- Target low-income individuals and minorities with highly-subsidized mitigation programs.

Local or regional government incentive programs that can be constructed to incorporate these elements include grants, tax credits, rebates that reduce (not eliminate) the direct cost of mitigation and subsidized financing programs that reduce the front-end (and/or interest) indirect cost of mitigation. If the payment of mitigation expenditures could be tied closely to the timing of payment for the property itself and/or with the property taxes, homeowners may perceive a worthwhile net value to the mitigation investment.

Specifically, strategic incentive programs consisting of long-term loans (15-30 years) that can be connected to mortgage amortization and/or local financing funded through special taxes or property tax assessment are the focus of this paper. An increasing number of such model programs have arisen within the area of environmental finance, and are gaining popularity among local governments as a way to promote personal expenditures on the energy efficiency of privately-held property.

Model Financing Programs in the Energy Sector

Across the U.S., several program concepts have been developed and implemented that are intended to produce environmental improvements to residential properties. It is useful to note that these programs contain five common elements:

- Long-term financing associated with the *useful life* of the improvement is provided, and can be connected to mortgage or property tax.
- No or low-interest loans are possible, in part due to securing the debt through an improved property.
- Programs are voluntary, so taxes (and other costs) are assessed only on those who participate.
- A participating property owner's improvement cost may be federally income tax deductible if connected to mortgage or property tax.
- Each can be funded and administered at the local level.

Four model programs that have been implemented in various parts of the country — California, Colorado and New York — are highlighted below. Chart 1 provides a comparison of features included in these as well as two additional programs not yet fully implemented — Florida and Vermont.

BerkeleyFirst

BerkeleyFIRST was a project developed by the City of Berkeley, California, and launched in 2008. The project pioneered the concept of the Energy Efficiency/Renewable Energy Contractual Assessment District (E-CAD), using a special taxing district — the “Sustainable Energy Financing District” — to finance the purchase and installation of renewable energy and energy efficiency improvements (namely solar panels) to existing private residences.⁵ Specifically, the program offered funding for solar PV improvements to private properties. It was funded by local government through

Chart: Comparison of Six PACE-Style Energy Improvement Loan Programs

	BerkeleyFIRST	Energy Independence Program	ClimateSmart	Green Homes Program	Leon Energy Assistance Program	Vermont PACE 2.0
Location	Berkeley, CA	Palm Desert, CA	Boulder, CO	Babylon, NY	Leon County, FL	Multiple municipalities in Vermont
Source of capital (financing)	PSO	PSO	PSO	Solid Waste Revolving Fund	PSO	PSO
Collection from participants	Special ad valorem property tax	Real property tax assessment	Real property tax assessment	Solid waste bill assessment	Real property tax assessment	Special assessment on property tax
Administration	Third party	City	County	City	County	Varies
Default risk	Municipality/ investors	Municipality/ investors	Municipality/ investors	Municipality	Municipality/ investors	Municipality/ investors
Tax lien senior to mortgage	Yes	Yes	Yes	Yes (Transfers to property tax bill if delinquent)	Yes	No
Reserve required of participants	No	No	No	No	No	Yes
Eligible use of funds	Specific solar energy improvements	Preapproved energy improvements	Preapproved energy improvements	Preapproved energy retrofits	Preapproved energy improvements	Preapproved energy improvements
Loan maximum	\$37,500	No maximum	\$50,000	\$12,000	\$7,000	Lesser of \$30,000 or 15% of assessed property value
Interest rates	7.75%	7%	Varies	3%	Fixed at 0.5% above 10-year US Treasury note	Undecided
Loan term	20-year maximum	20-year maximum	15-year maximum	3-15 year	10-year maximum	20-year maximum
Implemented	Yes	Yes	Yes	Yes	Taking applications	Legislation pending
Active as of January 1, 2011	No	No	No	Yes	NA	NA

the issuance of “micro” bonds for each project, a specialized form of Property Secured Obligation (PSO). Each bond was secured by and repaid through special taxes collected with ad valorem property taxes over 20 years from participating property owners.

The State of California Legislature passed legislation in 2008 to enable other localities to also create E-CADs based on the Berkeley model. At least a dozen other California municipalities subsequently implemented such programs.

Energy Independence Program

Also in California, the City of Palm Desert's Office of Energy Management (OEM) initiated some property owner incentives programs in conjunction with the local gas and power utilities providers in an effort to reduce energy use 30 percent by 2012. The Energy Independence Program (EIP) was launched in 2008 using the City's general fund for a first phase and the City's Redevelopment Agency bonds for a second phase. Long-term loans (with a term of up to 20 years) were provided to property owners for various eligible types of energy efficiency upgrades to their properties. Similar to the Berkeley program, each loan was secured through the property tax of participating property owners, but unlike the Berkeley program, no special tax was created. The loan payment was instead added as an assessment on the real property tax bill.

ClimateSmart Loan Program

Boulder County, Colorado, authorized \$40 million in bonding capacity for the ClimateSmart Loan Program in November, following state legislation earlier that year making it possible. ClimateSmart has been available to Boulder County residents to finance eligible energy improvements to their homes in an effort to reduce the County's carbon emissions. The loans are available for 15-year terms, and repayable through the homeowner's annual real property taxes.

Green Homes Program

The Township of Babylon, Long Island, New York, committed in 2008 to reduce carbon emissions by 12 percent by 2012, and to this end implemented a self-financing program that utilized their solid waste revolving fund to finance energy retrofits to existing buildings. This program differs somewhat from the first three discussed.⁶ Loan terms are generally shorter (varying from 3-15 years), and the repayment is made through a property owner's solid waste assessment bill (Benefit Assessment Payment) rather than through the property tax bill itself.

Program Successes

The programs were clearly successful based on evidence of participation. The Berkeley, Palm Desert and Boulder programs were 100% subscribed, meaning that all originally available funds were awarded. The Babylon program theoretically has unlimited funding since it is self sustaining through the solid waste reserve fund and the ability to levy assessments that return to the fund. The BerkeleyFIRST approach has been widely replicated in communities across the country.

The Boulder County ClimateSmart Loan Program was expanded to include commercial properties. The county began accepting commercial applications during January 2010. In addition, a new round of funding for residential projects was secured, and Boulder began accepting new residential applicants during March 2010. Numerous other local governments in Colorado have developed similar programs.

Further evidence of the success of these model programs lies in the political response to them. Such financing programs were recently endorsed by Vice President Biden as a national strategy for clean energy, and the Environmental Financial Advisory Board (EFAB) officially recommended the VEIB concept to the Environmental Protection Agency (EPA) as a viable financing technique that could be used in localities across the nation to encourage energy efficiency and clean energy usage. The following states have recently passed enabling legislation: CA, CO, FL, GA, IL, LA, ME, MD, MN, MO, NV, NH, NM, NY, NC, OH, OK, OR, TX, VT, VA, WI, with legislation pending in Arizona as well.

Overcoming Lender Concerns

Most of the existing and proposed energy incentive strategies are based on the Property Assessed Clean Energy (PACE) concept originally developed by Berkeley.⁷ Specifically, PACE allows qualified property owners to borrow money, with little to no upfront cost, to install renewable generation, energy efficiency, and water conservation measures. Because the PACE-type loan is paid back through a special assessment tax levied against the property, constituting a senior property lien (with legal precedent over the first mortgage), the back taxes (loan payments) must be paid back before the regular mortgage in the event of default.

The PACE strategy has received a lot of national attention in the past year centering on the issue of the senior tax lien. In May 2010, Fannie Mae and Freddie Mac (as charged by their parent entity, the Federal Housing Finance Agency, or FHFA) sent letters to lenders, reminding them that their agreements do not allow them to purchase loans that have a senior lien.⁸ These letters implied that borrowers with a PACE (or similar tax lien) would not be allowed to refinance or sell their properties unless the liens were paid off. Since two-thirds of the nation's mortgages right now are controlled by one of these entities — Fannie Mae or Freddie Mac — this development has had a wide-reaching effect on the ability of tax-lien-structured local financing programs to thrive. In fact, both the BerkeleyFirst and the residential ClimateSmart Loan programs have been suspended while the issue (hopefully) gets resolved.⁹

Federal legislative response.¹⁰ Responding to the new Fannie Mae-Freddie Mac underwriting standards, two identical Bills were introduced in the House and Senate in Summer 2010 intended to protect the PACE programs. U.S. House Representative Michael Thompson (D-CA) and 48 co-sponsors introduced House Bill 5766 on July 15, 2010 and Senator Barbara Boxer (D-CA) and 6 co-sponsors introduced Senate Bill 3642 on July 22, 2010 as attempts to ensure that homeowners with mortgages held by Fannie Mae and Freddie Mac would be able to participate in PACE without losing the ability to finance or refinance their homes. Each stated as its goal:

To ensure that the underwriting standards of Fannie Mae and Freddie Mac facilitate the use of property assessed clean energy programs to finance the installation of renewable energy and energy efficiency improvements.

Both Bills died in committee during the 2010 Session, but similar legislation has been reintroduced in the 2011 Session and has received bipartisan support in the House.

Public lawsuits filed in response.¹¹ Recently the State of California, the township of Babylon, New York, and Leon County in Florida filed suits against the federal agencies in an effort to reverse the regulatory actions that have undermined property-assessment-based loan programs. All of these lawsuits are currently still pending and are being decided within local jurisdictions.

Modifications to PACE programs as a response.¹² The Vermont Energy Act of 2009 included a section for the creation of energy efficiency loan programs using the PACE special districting concept. Like those of other states, Vermont's PACE program was adversely impacted by the actions taken by FHFA in 2010. Vermont's response, arguably, has been the most proactive in overcoming the new hurdles Fannie Mae and Freddie Mac have placed on such programs. The Vermont Energy Act of 2011, passed in the Vermont Legislature and signed by Governor Shumlin on May 26, 2011, does the following:

- (1) Subordinates the lien supporting the PACE assessment to any existing property-secured liens — this will comply with Fannie Mae and Freddie Mac concerns;
- (2) Requires all participating property owners to contribute a one-time non-refundable payment equal to 2% of the assessment to a reserve fund that will be available to repay any assessments in arrears due at closing in a default; and

- (3) Requires existing funds designated for energy efficiency be deposited into an escrow account maintained by the state treasurer (equal to 5% of the total assessments, total not to exceed \$1 million) to provide further protection from losses due to defaults that are not covered by the reserve fund.

Jointly, these direct and indirect efforts can reasonably be expected to have a favorable impact on the ease of reconstituting existing PACE programs as well as developing future programs.

Partnership Incentives for Financial Institutions

The model strategic concepts and programs discussed in this report so far share in common a direct financing relationship between the local government and the property owner. Programs that provide indirect financing through financial institution partnerships could also be valuable vehicles for encouraging home hardening in the State of Florida (particularly for the development of VHHLs). Planning of such programs is more complex, however, since incentives must be developed to promote the cooperation of the financial institutions (i.e., lenders) as well as the targeted property owners. The State of Florida has experience with this complexity, having recently experienced a failed mitigation loan program.

Two Programs Compared

It may be helpful to provide a quick comparison between one mitigation program (no-interest loans) and a similarly designed energy efficiency program (SmartWay Clean Diesel Loan Program).

State of Florida Home Mitigation No-Interest Loan Program¹³ In July 2008, the State of Florida's Department of Financial Services issued a Request for Proposal (RFP) for lending institutions to provide a no-interest loan program to residents who desired to harden their homes. The program was to offer loans of up to \$5,000 for a period of three years. No lending institutions responded to the RFP, and the program was canceled.

Nationwide SmartWay Clean Diesel Loan Program¹⁴ Also in Summer 2008, the Environmental Protection Agency (EPA) began a nationwide financing program to certified trucks that conserve fuel and reduce emissions. The program, as of now, consists of loans backed by \$3.4 million in EPA grants. To date, three financial institutions have been awarded grants, and are participating in the program. The loan rates range from 5.5–11 percent, and loan terms from 3-6 years are available, depending on the finance institution and the credit worthiness of the loan applicant. The program is ongoing, and currently under evaluation.

Points of Comparison

Two initial points of comparison may help explain why the Florida mitigation loan program never launched while the clean diesel loan program launched successfully during the same general time period. First, the linkage of the loan's term to the "useful life" of the property is important for lenders as part of their financial and underwriting considerations, and the two programs differ in this respect. Second, the effect of the timing of program launch on the appeal of the program to prospective lenders was likely considerable.

Linkage to useful life Even though both programs offered similarly short-termed financing, the useful life of the properties (or property improvements) being financed differ markedly. Trucks, for instance, are the properties targeted in the Clean Diesel Loan Program, judging by the same measure have at best a 10-year useful life. Bank loan terms for commercial truck purchases typically range from three-eight years, thus loans for "cleaner" trucks whose terms are set at three-six years not only passes a financial

institution's critical "useful life" test, but eases the conversion of standard truck loan financing contracts to those of the federally-subsidized contracts. Real property is considered to have at least a 30-year useful life, judging by the overwhelming willingness of financial institutions to extend 30-year loan terms for real estate purchases. Short loan terms for home hardening expenditures may complicate the mortgage approval process for lenders since three years is far short of the standard mortgage loan length.

Timing of launch It is also notable that the RFP issuance for the Florida no-interest loan program coincided with the timing of the subprime mortgage loan crisis and the subsequent fallout in the financial markets. Although the actual impact of that timing on the program's pick-up rate can never be known, it can be assumed any effect was adverse.

How Best to Design a Local Mitigation Financing Strategy

Assuming the future feasibility of a local mitigation financing strategy, this section homes in on *who* should be interested in VHHBs and VHHLs — the potential stakeholders — and *how* the conceptual policies must be fleshed out to optimize the benefits and minimize the risks to these parties. Thus, the focus is on the potential beneficiaries of VHHBs and VHHLs as well as on the specific structure characteristics that enhance the feasibility of using these financing strategies.

The Stakeholders

Localities looking into the feasibility of VHHBs and VHHLs will be interested in answering the question: "Who and how many will participate?" To some extent, anyone who benefits from windstorm mitigation is a beneficiary of programs that encourage mitigation. We attempt here to be specific, however, regarding the beneficiaries of programs that *finance*, rather than *provide* (through grants or other subsidies) windstorm mitigation for residential properties. In this section, the stakeholders in successful implementation of *mitigation financing* programs are discussed.

Participating Individual Residential Property Owners Current and potential homeowners arguably benefit from appropriate windstorm mitigation expenditures. We know from prior research that affordability of mitigation measures is a substantial barrier to mitigation for many homeowners.¹⁵ Financing that makes these expenditures more affordable by delaying costs over a long period of time at a low effective rate of interest can achieve two mitigation goals:

- (1) Low-cost, long-term financing increases affordability substantially over what it would be if either up-front payment, short-term conventional loan, or home equity loan were the only options; and
- (2) Financing, rather than subsidies or grants, keeps the homeowner's financial "skin in the game" such that there is an immediate and continued sense of interest in and responsibility for the effectiveness of the mitigation measure employed (e.g., hurricane shutters, impact-resistant windows).

Both the VHHB and VHHL concepts provide long-term, low-rate funding for home improvements. The major difference between the two is who the lender is — a public or private source. The advantages to the homeowner of dealing with one lender (local government) versus the other (bank or other finance company) are evaluated later in this report.

Government Various levels of government, regardless of whether directly involved with a specific financing program, benefit from policies that incentivize individuals to pay their costs of mitigation against windstorm disasters. Privately-funded expenditures reduce the social (general tax) burden on both a pre- and post-disaster basis. Individual mitigation efforts that result in lower windstorm damages create less pressure on

public assistance programs after a disaster. During disaster planning, governments whose citizens engage voluntarily in home hardening can allocate greater funds to the “common” costs of disaster mitigation and recovery, such as critical infrastructure.

These financing programs, when designed, implemented and promoted at the local level, reduce the pressure on already-overburdened State and Federal program funds. Municipalities and county governments participating in the design and implementation of local financing programs that encourage citizens to invest in windstorm mitigation would not have to compete for scarce general revenue in the state budget. They also enjoy more specific benefits from their participation. For instance, the choice of products, installers, and installation techniques that receive favorable financing can be controlled at the local level. Given the regional differences in the types of damages that are likely to be most severe, a homeowner in one locality (e.g., Miami) can be expected to financially benefit from a particular category of mitigation (e.g., hurricane shutters) to a greater degree than a homeowner in a different locality (e.g., Tallahassee).

Insurance Industry Property insurers, especially those doing business in Florida, have long encouraged the mitigation of buildings against windstorms. In fact, billions of insurance industry dollars have gone into the research and development of “best practice” home hardening designs, materials and techniques. Programs that improve the affordability of home hardening can reduce actual loss damages from windstorms, and thus reduce the cost of providing homeowners insurance.

Financial Services Industry and Investors The financial services industry can benefit from mitigation financing programs in two distinct ways. First, protecting homes against natural disasters decreases the risk of leveraging oneself financially to purchase a home. Thus, banks and other finance companies holding mortgages and home equity loans face a reduced risk of default. Second, to the extent that the financial services companies and other investors participate directly in providing the source of capital for these programs (especially in the case of VHHLs), they benefit from an increased demand for their principal and the resulting interest gains on that principal.

Construction and Windstorm Protection Industries The encouragement of home mitigation efforts inherently creates increased demand for the products and services of companies working in the manufacturing, construction, and windstorm protection industries. Increased demand likely leads to increased jobs for those in these and related industries.

Non-Participating Property Owners and Tenants Property owners and renters not participating directly in a mitigation financing program still are likely to benefit from such a program in multiple ways. First, a hardened home is not only less susceptible to direct damage from windstorms, but is also less likely to produce damage to neighboring buildings resulting from windborne debris. Thus, the neighbors benefit via reduced collateral risk to their own properties and belongings. Second, whether simply a matter of education by observation or a sense of peer pressure, there is evidence that individuals are more likely to engage in mitigation if their neighbors do. Research indicates that individuals react positively to efforts made by their neighbors.¹⁶ Finally, to the extent that local financing programs garner sufficient participation resulting in substantially reduced community or state-wide loss damages, all property owners benefit via lower taxes or assessments that might have otherwise become necessary.¹⁷

Financial Structure

The design of a local financing program for home improvements — whether for windstorm mitigation or another public purpose — must include sources of capital, along with financing and collection mechanisms that are appropriate for the types of improvements under consideration. Many possible sources of capital exist for funding these programs, and the choice of which source, or sources, to use may dictate the

decision as to how financing and collection are to be achieved. Chart 2 provides a comparative overview of the program design alternatives that are discussed below.

Chart 2: Comparison of Financing Programs by Sources of Capital

Sources of Capital	Mortgage Banks	Government Funds without Bonding	Municipal Bonds (e.g., PACE) as Government Funds	Housing or Economic Development Agency
Financing	Personal loan (secured or unsecured)	Loan or lease	Retail installment contract or special tax levied	Performance contract
Collection	Amortized payment	On property tax bill or by special assessment	On property tax bill or by special assessment	
Enhancements	Reduced interest rates; long terms	Rebates	Rebates	Aggregation
Underwriting criteria	Debt to income ratio	Tax payment history and clear title	Tax payment history and clear title	
Security interests	Property, improvement or unsecured	Real estate or other property lien	Real estate or other property lien	
Security enhancements	Guarantee fund		Reserve funds	

Sources of Capital

For most energy-savings financing programs, capital has been provided by banks or utility general funds. Given the importance of windstorm mitigation to the property insurance industry, insurers may provide an additional source of capital for mitigation financing programs. Other sources include manufacturers who help finance their own equipment, leasing companies, municipal bonds, state treasuries and pension funds, and housing and economic development agencies. Special Financing Districts (such as may be used to enable the use of VHHBs), with few exceptions, generally issue municipal bonds to obtain the needed capital. Given the growing popularity of this source of capital for energy efficiency improvements, it is worthwhile to note some of the specifics related to securing the needed funds.

Property secured obligation (PSO) Any type of improvement that can be linked to real property by a tax lien, and that can be reasonably expected to remain with the property when ownership changes, can be financed using a PSO. More important is the fact that with VHHBs individual property improvements could be pooled and financed together at the same time. One district (if necessary) could be created where all of the home hardening improvements could be financed together. Adapting existing PSO authority in Florida for VHHBs could be relatively simple. The sponsoring governments, through special taxing districts or directly, could issue district PSOs or limited PSOs

(the VHHB) to raise the cash to pay for the individual home hardening improvements. The sponsoring government could finance these improvements on behalf of property owners over an extended period of years at comparatively favorable rates.

Mortgage bank capital Similar to the PSO and accompanying VHHB, a type of improvement that can be linked to real property by a tax lien, and that can be reasonably expected to remain with the property when ownership changes, can be financed using mortgage bank capital. Local public policy that encourages mitigation improvements, in partnership with banks, can be leveraged to directly connect property owners with participating lenders who provide VHHLs. The primary advantages of local governments securing direct bank partnership through VHHLs over using PSOs are that the local government does not take the default risk and the bank can likely provide the capital more efficiently than can the local government. The main drawback with capitalizing the improvements through VHHLs is the difficulty in getting sufficient bank participation.¹⁸

Financing and Collection Mechanisms

Several options potentially are available for design of the financing of home improvements. This paper focuses on VHHBs and VHHLs for two reasons:

- (1) The concepts of VHHBs and VHHLs have in common long-term financing (i.e., ideally a minimum of 10 years and up to 30 years) for the property owner at competitive, or more favorable than competitive, costs; and
- (2) VHHBs and VHHLs can be developed and implemented at a relatively small cost to the local government and at no cost to higher levels of government.

Although this paper mentions other possible financing techniques, these other mechanisms may be less appropriate for home hardening improvements than for other types of improvements or may fail to overcome the homeowner's barriers to homeowner mitigation.

Voluntary Home Hardening Bonds (VHHBs) A Special Financing District uses a special tax or assessment levied through the property tax bill. With authority to distinguish between improved and non-improved properties, a sponsoring local government can collect through a special tax or non-ad valorem assessment on the improved properties. Not all taxpayers pay for these bonds; only those who request the improvements do.

The critical elements to the VHHB concept are:

- (1) Only those who participate in the financing program pay.
- (2) The VHHB is a PSO and is thus secured by a lien against the owners' property. When citizens agree to participate in the program, they agree to accept this special assessment against their property. Thus an assessment and lien against the property is created by contract. Because this is a PSO lien, it can be superior to all commercial liens and mortgages.
- (3) The term of payment can be extended far beyond conventional financing from banks or finance companies (with the important exception of the mortgage contract). The longer the PSO term, the lower the annual payment necessary to service the debt. The long term matches the useful life of the asset and enables the property owner to make affordable, lower payments over the term of the PSO.

The advantages of this mechanism over VHHLs and other financing methods are several:

- (1) A mortgage may impair a homeowner's credit whereas a tax lien may not.
- (2) A tax or assessment can be an annual payment in case a homeowner prefers less periodic payments.

- (3) Tax debt travels with the property along with the property improvement, such that whoever enjoys the continued use of the improvement continues to service the debt.
- (4) Tax debt does not have to be paid off upon sale of the property.

Voluntary Home Hardening Loans (VHHLs) There is history of mortgage banks offering variations on a traditional mortgage product. As is the case with the VHHB concept, this history has been observed primarily as relates to energy-savings improvements. Created during the Carter administration in 1979 to deal with the “energy crisis” of the 1970s, an Energy Improvement Mortgage (EIM) allows a new home buyer to get additional financing rolled into the first mortgage to cover the cost of energy improvements.¹⁹ These special mortgage products technically are available for new and existing homes, and for purchase as well as refinance funding.²⁰ If mitigation financing is achieved through a VHHL, similarly structured to an EIM, then the collection mechanism would bypass the local government, and the bank would directly collect through the mortgage loan payments. Despite the availability of EIMs, however, such products have rarely been used. The lack of popularity may be largely due to the already-challenging process of closing a home and the difficulty of calculating the EIM portion of the mortgage. No law prohibits banks from engaging in similar loan structures for home hardening improvements, and combined with public policy that encourages improvements, these could become popular with homeowners, particularly those with high credit scores.

Advantages of the VHHL financing method over VHHBs and other financing methods include:

- (1) Local government does not take the foreclosure risk.
- (2) With a tax lien, the property may be more difficult to sell as the debt service on the improvement is a non-negotiable cost of purchasing the home.
- (3) Property owners with high credit scores may be able to get lower-rate loans through a bank mortgage than through a property tax lien.

Other mechanisms Another potential financing source — insurance carriers — may be induced to offer financing for mitigation improvements in a way similar to that offered by some utilities districts by utilities companies for energy efficiency improvements.²¹ Conceivably, the insurer could front the funding for mitigation improvements to a home, and attach a charge to the hazard insurance policy for repayment of the financing. Failure to pay would result in policy cancellation. The qualifying mitigation improvements should reduce the insurer’s actual windstorm damage losses, thus reducing the overall insurance premium. Enticement of both the insurer and the insured homeowner, though, would require the insurance premium savings to be greater than the improvement surcharge. And the premium savings must be sustainable over the life of the improvement. Such a program would require the support of implementing utilities and approval from the utility regulators.

Underwriting Considerations

Regardless of the source of financing or the mechanisms used for financing and collection, appropriate underwriting must be integrated into the program design to reduce the probability that the property owner who benefits from the improvement fails to pay. Depending on the specific program chosen, the underwriting criteria can differ.

VHHB Underwriting

Prior to issuing the PSO, the sponsoring local government must review the value-to-lien ratio for each of the properties to be improved. The higher the value-to-lien ratio, the lower the risk of default. A full assessment of current liens against the citizen applicant's current real property should be made to ensure that the potential tax lien would not place the property or owner in a risky financial situation, where the debt exceeded the real property value. The property assessment serves to defend against property delinquencies and the resulting additional costs to local government that would be required to enforce the program (e.g., foreclosure). Underwriting should also include the individual applicant's tax payment history.

An element that could be added to PSOs and VHHBs to reduce the default risk would be guarantees and/or reserves. Efforts are currently underway to secure federal credit guarantees of Energy Financing District bonds. Particularly given the current strict climate in the credit sector, along with Fannie Mae and Freddie Mac's implicit resistance to the PACE concept, federal guarantees may help promote the credibility of VHHBs to all parties.

VHHL Underwriting

Mortgage banks and other lenders have longstanding expertise in mortgage underwriting. The same criteria used for conventional mortgage loans should be used for VHHLs, although there is justification for one notable modification. The debt-to-income ratio and the credit score are the industry standards as the primary mortgage underwriting criteria. The lower the debt-to-income ratio, the lower the risk of default. To the extent that a special home improvement can provide special savings (e.g., solar panels reduce the homeowner's energy bill, hurricane shutters reduce the homeowner's hazard insurance bill), the income portion (denominator) of the ratio may be increased to reflect the savings. Another program element that can reduce risk is the same as with VHHBs — guaranteeing loans or pre-funding reserves. This enables lenders to offer loans to a wider group of borrowers, and also allows lenders to offer lower interest rates because of security provided by the guarantee.

Consumer Protection Considerations

When undertaking a specially-financed or incentivized improvement project, an owner needs to achieve qualification approval of the project for the special financing program. Failure to meet the definition of a qualifying improvement (e.g., LEED certification for a building, hurricane rating for windows) can result in substantial economic damage (e.g., loss of government incentives, increased design and construction costs, increased costs of ownership, diminished asset value). With the possibility for such numerous and large economic damages for unfulfilled expectations, building owners can be expected to demand guaranteed product and installation approval in addition to guaranteed work.

Regardless of whether VHHBs, VHHLs or other mechanisms are used in program design, consumer protection measures should be included. A manufacturer/installer screening process is important to confirm that before inclusion on an approved list, businesses offering products/installation carry appropriate levels of insurance and bonding for the precise work to be performed or product to be provided, have good standing with the Better Business Bureau or equivalent, have not been excluded from government contracts, and have a history of good product performance — at least for the period equivalent to the payback period. Regarding insurance, minimum requirements should be **at least** the following:

- (1) For the product manufacturer — minimum general liability coverage, including a product liability extension with limits of liability of no less than \$1 million per occurrence and \$3 million in the aggregate; and

- (2) For the installer, a valid license to operate in the jurisdiction plus general liability insurance, with a completed operations extension of \$1 million for each event and \$3 million in the aggregate with a minimum claims period of five years.

Additionally, participating homeowners must be assured that if the improvements made fail (whether due to defects or faulty installation), they will be repaired/replaced or the payment obligation will end, that repair costs will not increase the monthly payment amount, and that bonding and contractor certification will ensure post inspection and warranty problems will be satisfactorily resolved. The sponsoring local government should require warranties, insurance and performance bonds from the manufacturers and installers of the improvements. The coverage amounts must be adequate to repair potential damages incurred during installation and as necessary to restore the improvement or product to good working order.

Government Participation

Depending upon the precise program design, government participation in mitigation financing strategies can be minimal or extensive. At the state and local level, participating costs may be incurred — purposefully or inadvertently. Government may choose to participate in the costs by creating program enhancements that further incentivize homeowners or financial partners (e.g., banks, insurers) or they may participate through loss of revenue that would have otherwise been due (e.g., tax credits, exemptions or deductions). Some of the potential costs are discussed here.

General Funds

In general, local governments are concerned about any risk to their general funds. Neither VHHBs nor VHHLs necessitate using these critical dollars. Using the VHHB approach, special tax revenue bonds that are payable only from special taxes, assessments, and the proceeds from any foreclosures deemed necessary results in bonds that are not a general obligation of the municipality, county or other government region. Therefore, the debt does not count against the local government's debt limit, nor does it impact the local government's credit rating or otherwise create a direct liability to the local government's general fund.

Even with these financial concerns, a government may choose to share a limited amount of general (or other) funds with the financing program for the purpose of promoting homeowner participation. Spent on enhancements that further encourage homeowners to take advantage of the underlying incentive, this may be a wise use of general funds. One common way to enhance a financing program is to provide a direct payment for implementing measures that offset some of the project costs. For instance, a mitigation financing program can offer free windstorm inspections for homeowners or cover the costs of "handholding" a homeowner through the application process to reduce transaction costs.

Local Administration Costs

Using a VHHL design, a local government can develop a financing strategy to incentivize home hardening with minimal administration costs. The main cost to the locality in this case would be the cost of marketing and promotion. Using a VHHB design, on the other hand, may require much more extensive local government involvement.

City managers and finance departments generally have experience managing improvement projects and structuring tax assessments. Local government may, however, find the review of applications cumbersome and the multiple and cumulative capital costs expensive. Furthermore, a locality has to seek out a source of capital for the VHHBs that recognizes the value of the qualifying home hardening property

improvements. Some municipalities may find that outsourcing administration costs to a third party is the most cost-effective means to running the program. Using the existing energy-savings incentives programs as models, however, a locality of substantial size may find internal administration feasible and preferable to outsourcing.²²

Participation via Lost Revenue

Federal tax law provides that the interest component of special tax/assessment payments are deductible from both federal and state income taxes — as are the interest payments on home mortgages and home equity loans. State and local tax laws may or may not be designed similarly, and may further incentivize program participation through additional tax credits, exemptions and/or deductions.

Conclusions

Locally-administered mitigation financing programs are viable for promoting residential property improvements. There exists a significant amount of interest in the concept from Federal and State policy makers; we see action in finding innovative ways to fund improvements that make homes more windstorm resistant and environmentally friendly.

Local financial incentives programs taken from renewable energy and energy efficiency initiatives already implemented in places such as California, Colorado and New York are viable models worth consideration. The passage of PACE legislation in many states, and the support for it at the Federal Government level, reveal the active interest that government has in encouraging local “ownership” of solutions to the energy problem. Inclusion of windstorm resistance improvements in the recently-passed Florida version of PACE-enabling law opens the way to design home mitigation financing strategies similar to those used to encourage energy-saving improvements.

Regarding how best to design and implement a local financing program for home mitigation, the key appears to be long-term, affordable financing that is underwritten carefully and linked to the property rather than to the property owner. Both the VHHB and VHHL approaches accomplish this. The current conflict between Fannie Mae and Freddie Mac, the Federal government and mortgage companies regarding the underwriting of homes subject to PACE liens may slow the growth of the VHHB style of financing home hardening, but continued Federal Government interest in the program’s success is likely to overcome the current resistance. Meanwhile, the VHHL approach is available and can serve as a stop-gap measure for communities that wish to pursue local mitigation financing now.

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Endnotes

- (1) The author gratefully acknowledges financial support from the State of Florida Department of Community Affairs — Residential Construction Mitigation Program and the Florida Catastrophic Storm Risk Management Center.
- (2) RMS (2009), Kunreuther (2008), Frostin and Holtman (1994), and others have consistently found significant net cost savings linked to appropriate property mitigation efforts.
- (3) The disastrous impact of the Deepwater Horizon Oil Spill on the Gulf Coast economies further hindered residential windstorm mitigation efforts in those areas hardest hit. On the other hand, the oil spill catastrophe serves as another wake-up call to coastal residents about the broad exposure to catastrophes — natural and man-made — living in a coastal region brings.
- (4) He posits that benefits of mitigation are discounted at such high discount rates that they have a small present value relative to costs.
- (5) Also known as Property Assessed Clean Energy (PACE) programs, Voluntary Environmental Improvement Bond (VEIB) programs, and Energy Loan Tax Assessment Programs (ELTAP).
- (6) Similar programs in other states (such as Massachusetts) exist, but are so similar to the Babylon model in their use of non-PSO funding (i.e., they rely on revolving funds, such as Massachusetts's Clean Water State Revolving Fund) as to be repetitive in discussion.
- (7) The Florida State Legislature, in particular, recently enabled its PACE-based strategies to apply more broadly by specifically naming windstorm hardening measures, in addition to energy savings, in the list of improvements that can be made within a Florida community PACE program.
- (8) Timiraos (May 17, 2010).
- (9) Notably, the ClimateSmart program continues to accept applications from commercial property owners for funding. Continuation of the commercial loan segment of the program serves as de facto evidence of the program's success, notwithstanding the government lender challenges on the residential side.
- (10) <<http://www.encyclopedia.com/doc/1G2-3546701000.html>>
- (11) Brown (2010), Ruggeri (2010) and Brown (2010). The Federal Housing Finance Agency (FHFA), in October 2010, filed a motion to dismiss the California lawsuit.

- (12) Miller (2011), Lillian (2011).
- (13) In 2006, the Florida Legislature created the Florida Comprehensive Hurricane Damage Mitigation Program and appropriated \$250 million to provide financial incentives to encourage residential property owners in Florida to harden their homes against hurricanes by retrofitting their properties. The Department of Financial Services (DFS) was directed to develop a program to provide no-interest loans to homeowners and manufactured homeowners for installation of mitigation measures. Section 215.5586, F.S., was amended during the 2008 Session of the Legislature to require the department to set aside \$10 million of the original \$250 million appropriation to the MSFH program to implement a no-interest loan program by October 1, 2008. After no qualified vendor was successfully secured to implement the program, 215.5586(8), F.S., was amended to delete the requirement that DFS set aside \$10 million for the program.
- (14) See, www.epa.gov/diesel/prgfinance.htm.
- (15) Peacock (2003), International Hurricane Research Center (2004), Kunreuther and Kleffner (1992) and Kunreuther (2006).
- (16) Peacock (2003) and Kunreuther et al (2009).
- (17) For instance, the State of Florida's residual property insurer, Citizens Property Insurance Corporation, and reinsurer, the Florida Hurricane Catastrophe Fund, may charge assessments to private insurers (and their policyholders) for financial recovery from past catastrophic windstorm losses.
- (18) As discussed in the First Report, the State of Florida's Department of Financial Services issued a Request For Proposal (RFP) to lending institutions in July 2008 to provide a no-interest loan program to residents who desired to harden their homes. The program was to offer loans of up to \$5,000 for a period of three years. No lending institutions responded to the RFP, and the program was canceled.
- (19) An EIM, which allows the buyer to borrow more money to invest in efficiency improvements, is different than an Energy Efficiency Mortgage (EEM), which gives an efficient home a more favorable mortgage interest rate.
- (20) The Vermont Energy Investment Corporation launched a pilot program more than a decade ago, albeit with little participation. New programs recently have been launched in Colorado, Maine, and New York.
- (21) A tariffed installation program (TIP) uses a utility's billing system to collect a charge attached to the meter as a special tariff. Typically, the monthly charge must be less than the expected savings from the efficiency improvements and charged for a period less than the life of the efficiency measure being installed.
- (22) With the exception of BerkeleyFIRST, the model programs discussed here were administered by local government staff.²³ According to the *Guide to Energy Efficiency and Renewable Energy Financing Districts for Local Governments*, Palm Desert's EIP and Babylon's Green Homes programs are administered by 1.5 and 3 full-time equivalent (FTE) local staff, respectively.