LINKED DEPOSITS:

FINANCING FOR ENERGY EFFICIENCY IN AFFORDABLE HOUSING

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WORKBOOK OBJECTIVES

This workbook is intended to present the low-income energy and housing advocate with the necessary tools and discussion to present a specific linked deposit energy efficiency proposal to potential depositors. More specifically, the workbook will:

Objective #1: **Detail a linked deposit program as one option for financing energy efficiency in affordable housing programs:** Linked deposit programs can be an important source of capital to housing developers seeking to reduce total shelter costs to either home buyers or tenants. This workbook will both explain the concept of linked deposits and provide specific documents to help implement such a program.

Objective #2: **Provide a justification for linked deposit programs in a form that will allow advocates to present proposals to potential depositors:** Linked deposit programs can benefit not only the developer, but *all* of the parties to the transaction, including both the lender and the depositor. This workbook will present the advantages of a linked deposit energy efficiency transaction to all involved.

Objective #3: **Present the financial impacts of a linked deposit program from both the depositor's and the consumer's perspective in a form that will allow advocates present proposals to potential depositors:** A linked deposit program will reduce total shelter costs to consumers at a minimum expense to the depositor. This workbook will present the details of these financial impacts.

Objective #4: **Suggest potential institutions from which advocates might seek linked deposits in support of energy efficiency improvements:** Linked deposit programs in support of economic development and housing programs have historically been pursued by state and local governments. In addition, however, institutions ranging from utilities to insurance companies should have an interest in this financing mechanism. This workbook presents the rationale with which developers might approach linked deposit partners.

This workbook assumes the developer has decided to pursue energy efficiency as a cost reduction strategy and is seeking assistance on developing a specific linked deposit proposal as a financing mechanism.

INTRODUCTION

What is the Purpose of this Workbook

The purpose of this workbook is to provide assistance to community-based organizations, local government planners, affordable housing developers, energy planners (public and private), and others interested in providing affordable housing. This workbook focuses on financing energy efficiency in affordable housing units through establishing a linked deposit program. While the focus of the workbook is on single family units, linked deposits are available for financing energy efficiency in multi-unit dwellings as well.

The workbook will assist persons who are providing affordable housing through:

- first time home buyer programs
- moderate or substantial rehabilitation
- new construction

In addition, the workbook will provide guidance to persons interested in establishing programs to finance energy efficiency through energy retrofits at the time of:

- a change of ownership
- refinancing

Energy Efficiency as a Shelter Cost-Reduction Strategy

Installing energy efficiency in the home is an excellent mechanism to use in improving overall housing affordability. Reducing a $1500 annual home energy bill by 15 percent saves the consumer $225. If that consumer earns $12,000 a year, he or she has just increased their disposable income by almost two percent per month. This increased affordability helps not only the consumer, but the lender and developer of the affordable housing as well.

Lender Barriers to Financing Energy Efficiency

Despite the benefits that arise from the installation of energy efficiency measures, multiple barriers impede their penetration. From a lender's perspective, the technical nature of determining energy conserving potentials, and thus of determining the efficacy of investment in any particular energy efficiency measure, entails a specialized knowledge. The estimation and measurement of savings, as well as the valuation of risk, have not fit into historical investment expertise.

Moreover, energy efficiency measures often have greater payback periods than those required in the traditional terms of commercially available capital. Accepted payback periods for efficiency measures reach up to seven (7) years. The longer term commitment of dollars required by these measures reduces an investor's liquidity. Conversely, the resulting short term of the bank loan increases the monthly debt service cost to the person seeking financing.

LINKED DEPOSITS ADDRESS LENDER BARRIERS

Lack of lender experience in assessing efficiency programs.

Payback periods exceeding typical commercial loans.

A final barrier to financing energy conservation equipment through traditional financial institutions includes the lack of generally accepted collateral for the loan. Lenders often believe that the measures are ill-suited to be collateral for a loan since the removal of such measures is both difficult and expensive. Moreover, there is a lack of a readily identified secondary market for such measures.

Developer Barriers to Financing Energy Efficiency

Several obstacles impede the aggressive inclusion of energy efficiency measures by institutions involved with the development of low-income housing. Perhaps the most significant obstacle is the "over-improvement" of the properties in the first instance.

This "over-improvement" is significant for those seeking additional debt with which to finance energy efficiency measures, even if such measures are cost-effective over the lifetime of the project. In those instances where a housing developer has borrowed at or in excess of traditional loan-to-value ratios, additional debt most often will *not* be provided for energy efficiency measures. Traditional lenders view energy efficiency investments as additional capital investments, while not taking into account the reduced operating costs that arise as a result of the energy savings (and thus reduced bills).

The situation identified above can be summarized as two problems: first, there is the inability to receive additional debt financing through traditional lenders, even for cost-effective energy efficiency improvements. Second, there is the unwillingness of lenders to account for energy savings in their underwriting criteria.

LINKED DEPOSITS ADDRESS DEVELOPER BARRIERS

"Over-improved" properties that cannot support more debt.

Failure of appraisal to account for energy efficiency value.

A second major obstacle to the pursuit of energy efficiency measures in low-income housing developments is the "hassle factor." Developers are meeting an increasing number of mandatory regulations. As one developer pointedly observed: "when it comes down to lead paint abatement or energy efficiency improvements, energy efficiency loses." This problem boils down to a problem of technical and human capacity (or rather lack thereof) to add another layer of "things to do."

A solution to each of these problems is a linked deposit programs.

The Concept of a Linked Deposit

A linked deposit program uses specific deposit arrangements to leverage specific types of loans or to target lending to a special type of borrower by the institution receiving the deposit. According to one description:

> * * *linked deposit programs generally allow for discretionary funds to be deposited in such a way as to support programs of particular public benefit. These programs are often characterized by below-market interest rates, flexible terms, and careful targeting to specific credit needs. A well-designed linked deposit program can therefore not only encourage financial institutions to make loans for low-cost housing, agriculture, and economic development, but can also enable these loans to be made at lower interest rates to the borrower.

Flax-Hatch, "Public Deposits as Development Tools," *Economic Development & Law Center Report*, at 3 (Summer 1989).

The Policy Underpinnings and Program Objectives of Linked Deposits

The policy underpinnings of linked deposit programs involve efforts to direct private sector lending into designated areas. Linked deposit programs use the power inherent in an institution's role as a major bank customer to bring about improved bank performance in advancing objectives such as locally-based economic development, affordable housing, and non-discriminatory lending practices.

LINKED DEPOSIT PROGRAMMATIC OBJECTIVES

To generate additional private capital for desired investments

To make that capital more affordable to the targeted population

To serve as the catalyst for lending activity.

The programmatic objectives of a linked deposit program are: (1) to generate additional private capital; (2) to target that capital to desired investments; (3) to make that capital more affordable to the targeted population; and (4) to serve as the catalyst for lending activity.

The Operation of Linked Deposit Programs

A typical linked deposit program is as easy as 1-2-3:

1. The depositor purchases certificates of deposit from eligible banks using funds it would otherwise be placing on deposit with some financial institution.

2. The financial institution, in turn, lends those funds for earmarked purposes to borrowers who meet eligibility criteria.

3. In exchange for a lowered rate of return on the deposit, the bank agrees to charge a lower interest rate on linked deposit loans to borrowers.

The Organization of this Workbook

To assist in the preparation and presentation of linked deposit proposals to potential depositors, this workbook is presented in five parts:

Part 1 explores the reasons why a linked deposit program supporting energy efficiency benefits consumers;

Part 2 explains the reasons why a linked deposit program supporting energy efficiency benefits the lender;

Part 3 explains the reasons why a linked deposit program supporting energy efficiency benefits the depositor;

Part 4 explains the linked deposit financial transaction; and

Part 5 identifies a range of housing programs which can be supported through a linked deposit energy efficiency program.

More technical material referenced in the discussions is presented in the various appendices where appropriate. In addition, the workbook presents worksheet templates that allow the advocate or developer to develop the calculations specific to his or her own circumstances. Model documents that can be copied and used by local advocates are also appended.

SECTION 1: THE CONSUMER'S PERSPECTIVE

Energy efficiency improvements in homes offered by affordable housing developers can put cash in the pockets of low-income consumers. In this regard, it matters not whether the homes are occupied by homeowners or by tenants.

The purpose of this section is to help affordable housing developers explain the net present value benefits of energy efficiency to low-income consumers as well as the cash flow benefits.

Typical Dollar Savings to Consumers

Typical energy efficiency measures can yield tremendous dollar savings to consumers living in affordable housing. Three examples are presented below to illustrate what impacts energy efficiency measures can have. In the illustrations below, consumers are assumed to use natural gas for both space heating and domestic hot water heating.

The three illustrations include:

- increasing ceiling insulation
- installing new domestic hot water heaters
- engaging in blower door guided air sealing

Dollar Savings Flowing from Ceiling Insulation

A typical energy efficiency improvement involves increasing the level of ceiling insulation from R-11 to R-40. Assuming a ceiling area of 1600 square feet and a natural gas price of $0.70 per therm --a therm is the typical measure of natural gas energy; it is the functional equivalent of a cubic foot of gas (CCF)-- such an efficiency measure could be expected to generate a net present value benefit of $2,657 over 15 years. Actual savings can vary based on household use characteristics as well as local climate conditions and other factors.

The heating savings assumed in this discussion (translated into dollars) can be found in Appendix A. In addition, Worksheet 1 allows an advocate or developer to estimate energy savings based on factors specific to local circumstances. Worksheet 2 allows an advocate or developer to estimate dollar savings.

Dollar Savings Flowing from Hot Water Efficiency

Domestic hot water (DHW) consumption can be expected to be roughly 20 percent of a consumer's total energy consumption. DHW consumption has basically three components to it:

1. The energy necessary to heat the water;

2. The energy lost through the water heater jacket and distribution pipes while not being used; and

3. The pilot burner.

The primary energy efficiency savings can occur in the components involving water heating and stand-by losses. In particular, older DHW heaters have energy efficiency ratings in the 55 percent range. In contrast, new heaters have efficiencies in the 70 percent range.

Savings in stand-by losses will primary accrue from an increased R value in the shell of the water heater tank. Older DHW heaters have shell R values of roughly 3. New DHW heaters have R values of 15.

Because the calculation here is intended to be illustrative and not comprehensive, stand-by losses attributable to distribution pipes are not considered.

The total annual energy savings from the installation of a more efficient DHW heater can be expected to reach more than 81 therms per year. At a price of $0.70 per therm, such an efficiency measure could be expected to generate a net present value benefit of more than $850 over 15 years.

The DHW savings assumed in this discussion (translated into dollars) can be found in Appendix A. In addition, Worksheet 3 allows an estimation of hot water energy savings based on factors specific to local circumstances. Separate worksheets are provided for energy losses and system efficiency. Worksheet 4 allows an estimate of dollar savings.

Dollar Savings Flowing from Air Sealing

A final source of substantial energy (and thus bill) savings for low-income housing --even new construction and particularly substantial or moderate rehabilitation-- involves "air sealing." Air sealing involves the use of a blower door to "plug" the small leaks that may exist in different places in a home.

Even homes that are newly constructed or rehabilitated may have significant air leakage.

Even homes that are newly constructed or rehabilitated may have significant air leakage. Tiny cracks around chimneys, floors and windows may, in the aggregate, result in the substantial loss of heating energy.

The total annual energy savings from air sealing can be expected to reach more than 600 therms per year. At a price of $0.70 per therm, such efficiency improvements could be expected to generate a net present value benefit of more than $6,500 over 15 years. Actual savings can vary based on household use characteristics as well as local climate conditions and other factors.

The air sealing savings assumed in this discussion (translated into dollars) can be found in Appendix A. In addition, Worksheet 5 allows an estimate of energy savings based on factors specific to local circumstances. Worksheet 6 allows an estimate of dollar savings.

Effective Impact of Energy Efficiency on Shelter Costs

The impact of generating these energy savings is to, in effect, decrease the cost of procuring housing (whether through home purchase or through rentals). If the efficiency measures are installed in "for sale" properties, the effective impact is either to reduce the price of the home or to reduce the interest rate. The term "effective impact" refers to the price or interest rate reduction that would be necessary to generate the same dollar savings as the energy efficiency measures generate.

To the extent that a home involves rental property, energy efficiency savings will generate effective rent reductions.

The effective interest rate and purchase price reduction must, of course, be netted against the cost of the energy efficiency measure. A new energy efficiency measure would be pursued only if the savings from the measure exceeds its cost of installation. The same is true for rent reductions as well.

Effective Purchase Price Reduction

The first means of looking at the Net Present Value savings of the energy efficiency investment is to convert those savings into an effective discount on the original purchase price of the house. This measure sets forth the NPV savings as a percent of the original purchase price. By obtaining $3,000 in NPV energy efficiency savings, in other words, the homeowner has accomplished the same result as he would have accomplished by reducing the purchase price of a $30,000 home by ten percent.

Effective Interest Rate Reduction

A second way to view the Net Present Value savings from the perspective of the household is to calculate the effective interest rate discount that the energy efficiency investment "buys." This involves a two-step process:

1. To calculate this discount, the present value of the payments (energy plus mortgage) in the "without energy efficiency" scenario is determined.

2. The present value of the payments in the "with energy efficiency" scenario is next determined.

The effective discount on the interest rate is thus the Internal Rate of Return (IRR) needed to make those two payment streams equal.

A national study found that energy efficiency investments would have the same effective impact as reducing the purchase price of a home by from two to eight percent (depending on the region of the country). The same study found that the effective interest rate discount to range from 11 to almost 60 basis points (again depending on the region of the country).

Energy efficiency investments will have the same effect as would reducing the purchase price of a home by from two to eight percent.

Worksheet 7 provides the way to determine and present the effective interest rate and purchase price discount.

Worksheet #1(a) (Illustration) Calculating Energy Savings from Insulation			
		Without Energy Efficiency	With Energy Efficiency
1	Area of insulated (square feet)	1,600	1,600
2	Heating degree days	6,000	6,000
3	Hours in day	24	24
4	R value of insulation	11	40
5	Heat loss through this area (BTUs) /a/	20,945,455	5,760,000
6	Heat loss (therms) (BTUs / 100,000) /b/	209	58
7	Reduced heat loss due to insulation (therms) /c/		151
8	System efficiency		.60
9	Total energy savings /d/		253

NOTES:

/a/ (Line 1 x Line 2 x Line 3) / Line 4
/b/ Line 5 / 100,000
/c/ Therms and ccf are functionally equivalent. Thus, for example, 100 therms = 100 ccf.
/d/ Line 7 / Line 8

Worksheet #1(b) (standard calculation form) Calculating Energy Savings from Insulation			
		Without Energy Efficiency	With Energy Efficiency
1	Area of insulated (square feet)		
2	Heating degree days		
3	Hours in day	24	24
4	R value of insulation		
5	Heat loss through this area (BTUs) /a/		
6	Heat loss (therms) (BTUs / 100,000) /b/		
7	Reduced heat loss due to insulation (therms) /c/		
8	System efficiency		
9	Total energy savings /d/		

NOTES:

/a/ (Line 1 x Line 2 x Line 3) / Line 4
/b/ Line 5 / 100,000
/c/ Therms and ccf are functionally equivalent. Thus, for example, 100 therms = 100 ccf.
/d/ Line 7 / Line 8

Worksheet #2(a)
(Illustration)
Calculating Dollar Savings from Insulation

Year	Price /a/	Energy Savings	Dollar Savings
1	$0.70	253	$177
2	$0.70	253	$177
3	$0.70	253	$177
4	$0.70	253	$177
5	$0.70	253	$177
6	$0.70	253	$177
7	$0.70	253	$177
8	$0.70	253	$177
9	$0.70	253	$177
10	$0.70	253	$177
11	$0.70	253	$177
12	$0.70	253	$177
13	$0.70	253	$177
14	$0.70	253	$177
15	$0.70	253	$177
Total:			$2,655

NOTES:

/a/ The future stream of revenue here has not been discounted. The process of taking the non-discounted revenue as the basis for calculating future value is appropriate provided that the projected rate of growth in price is equal to the expected rate of the discount.

Worksheet #2(b)
(standard calculation form)
Calculating Dollar Savings from Insulation

Year	Price /a/	Energy Savings	Dollar Savings
1			/b/
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
Total:			/c/

NOTES:

/a/ The future stream of revenue here has not been discounted. The process of taking the non-discounted revenue as the basis for calculating future value is appropriate provided that the projected rate of growth in price is equal to the expected rate of the discount.
/b/ Column 1 x Column 2
/c/ Sum of Column 3

Worksheet #3(a)
(Illustration)
Calculating Stand-by Energy Loss Savings from Domestic Hot Water Heater Upgrade

		Without Energy Efficiency	With Energy Efficiency
1	Area of hot water heater (square feet)	17.5	17.5
2	Hours in year	8,760	8,760
3	Ambient air temperature at DHW heater location (F)	72	72
4	Hot water temperature in tank (F)	135	135
5	U value of water heater shell (R value 3.5) /a/	0.29	0.07
6	DHW heater efficiency	0.55	0.70
7	Heat loss through DHW heater shell /b/	2,800,791	676,053
8	Heat loss (therms) /c/	28	7
9	Reduced heat loss due to DHW upgrade /d/		21 /e/

NOTES:

/a/ The "U value" of the hot water heater shell is the inverse of the R value (1 / R value)
/b/ (Line 1 x Line 2 x Line 3) / Line 4
/c/ Line 5 / 100,000
/d/ Therms and ccf are functionally equivalent. Thus, for example, 100 therms = 100 ccf.
/e/ Column 2 - Column 3

Worksheet #3(b)
(standard calculation form)
Calculating Stand-by Energy Loss Savings from Domestic Hot Water Heater Upgrade

		Without Energy Efficiency	With Energy Efficiency
1	Area of hot water heater (square feet)		
2	Hours in year	8,760	8,760
3	Ambient air temperature at DHW heater location (F)		
4	Hot water temperature in tank (F)		
5	U value of water heater shell (R value 3.5) /a/		
6	DHW heater efficiency		
7	Heat loss through DHW heater shell /b/		
8	Heat loss (therms) /c/		
9	Reduced heat loss due to DHW upgrade (therms) /d/		/e/

NOTES:

/a/ The "U value" of the hot water heater shell is the inverse of the R value (1 / R value)
/b/ (Line 1 x Line 2 x Line 3) / Line 4
/c/ Line 5 / 100,000
/d/ Therms and ccf are functionally equivalent. Thus, for example, 100 therms = 100 ccf.
/e/ Column 2 - Column 3

Worksheet #3(c) (Illustration) Calculating Consumption Energy Savings from Domestic Hot Water Heater Upgrade			
		Without Energy Efficiency	With Energy Efficiency
1	Specific weight of water	8.33	8.33
2	Gallons of hot water use per person per day	25	25
3	Number of persons per dwelling unit	3	3
4	Temperature of water in tank	135	135
5	Water input temperature	68	68
6	Days in year	365	365
7	System efficiency	.55	.70
8	BTU's consumption	27,778,657	21,826,088
9	Therm consumption	278	218
10	Savings from upgrade		60
NOTES:			

Worksheet #3(d) (standard calculation form) Calculating Consumption Energy Savings from Domestic Hot Water Heater Upgrade			
		Without Energy Efficiency	With Energy Efficiency
1	Specific weight of water	8.33	8.33
2	Gallons of hot water use per person per day		
3	Number of persons per dwelling unit		
4	Temperature of water in tank		
5	Water input temperature		
6	Days in year	365	365
7	System efficiency		
8	BTU's consumption	/a/	
9	Therm consumption	/b/	
10	Savings from upgrade		/c/

NOTES:

/a/ (Line 1 x Line 2 x Line 3 x (Line 4 - Line 5) x Line 6) / Line 7
/b/ Line 8 / BTU's per energy unit. There are 100,000 BTUs in a therm of gas; 3412 BTUs in a kWh of electricity.
/c/ Column 1 (line 9) - Column 2 (line 9)

Worksheet #4(a)
(Illustration)
Calculating Dollar Savings from Hot Water Efficiency

Year	Price /a/	Energy Savings /b/	Dollar Savings
1	$0.70	81	$57
2	$0.70	81	$57
3	$0.70	81	$57
4	$0.70	81	$57
5	$0.70	81	$57
6	$0.70	81	$57
7	$0.70	81	$57
8	$0.70	81	$57
9	$0.70	81	$57
10	$0.70	81	$57
11	$0.70	81	$57
12	$0.70	81	$57
13	$0.70	81	$57
14	$0.70	81	$57
15	$0.70	81	$57
Total:			$855

NOTES:

/a/ The future stream of revenue here has not been discounted. The process of taking the non-discounted revenue as the basis for calculating future value is appropriate provided that the projected rate of growth in price is equal to the expected rate of the discount.

/b/ Hot water energy savings include two components: (1) consumption savings; and (2) savings from reduced stand-by energy losses.

Worksheet #4(b)
(standard calculation form)
Calculating Dollar Savings from Hot Water Efficiency

Year	Price /a/	Energy Savings	Dollar Savings
1			/b/
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
Total:			/c/

NOTES:

/a/ The future stream of revenue here has not been discounted. The process of taking the non-discounted revenue as the basis for calculating future value is appropriate provided that the projected rate of growth in price is equal to the expected rate of the discount.
/b/ Column 1 x Column 2
/c/ Sum of Column 3

Worksheet #5(a) (Illustration) Calculating Energy Savings from Air Sealing			
		Without Energy Efficiency	With Energy Efficiency
1	Air changes per hour	.75	0.3
2	Volume of house (40 x 40 x 20)	32,000	32,000
3	Constant	0.018	0.018
4	Heating degree days	6,000	6,000
5	Hours per day	24	24
6	Heat loss due to leakage (BTUs) /a/	62,208,000	24,883,200
7	Heat loss (therms) /b/	622	249
8	Reduced heat loss due to air sealing (therms) /c/		373
9	System efficiency		.60
10	Total Energy savings /d/		622

NOTES:

/a/ Line 1 x Line 2 x Line 3 x Line 4 x Line 5
/b/ Line 6 / 100,000
/c/ Therms and ccf are functionally equivalent. Thus, for example, 100 therms = 100 ccf.
/d/ Line 8 / Line 9

Worksheet #5(b) (standard calculation form) Calculating Energy Savings from Air Sealing			
		Without Energy Efficiency	With Energy Efficiency
1	Air changes per hour		
2	Volume of house (area x height)		
3	Constant	0.018	0.018
4	Heating degree days		
5	Hours per day	24	24
6	Heat loss due to leakage (BTUs) /a/		
7	Heat loss (therms) (BTUs / 100,000) /b/		
8	Reduced heat loss due to air sealing (therms) /c/		
9	System efficiency		
10	Total Energy savings		/d/

NOTES:

/a/ Line 1 x Line 2 x Line 3 x Line 4 x Line 5
/b/ Line 6 / 100,000
/c/ Therms and ccf are functionally equivalent. Thus, for example, 100 therms = 100 ccf.
/d/ Line 8 / Line 9

Worksheet #6(a)
(Illustration)
Calculating Dollar Savings from Hot Water Efficiency

Year	Price /a/	Energy Savings /b/	Dollar Savings
1	$0.70	622	$435
2	$0.70	622	$435
3	$0.70	622	$435
4	$0.70	622	$435
5	$0.70	622	$435
6	$0.70	622	$435
7	$0.70	622	$435
8	$0.70	622	$435
9	$0.70	622	$435
10	$0.70	622	$435
11	$0.70	622	$435
12	$0.70	622	$435
13	$0.70	622	$435
14	$0.70	622	$435
15	$0.70	622	$435
Total:			$6,525

NOTES:

/a/ The future stream of revenue here has not been discounted. The process of taking the non-discounted revenue as the basis for calculating future value is appropriate provided that the projected rate of growth in price is equal to the expected rate of the discount.

/b/ Hot water energy savings include two components: (1) consumption savings; and (2) savings from reduced stand-by energy losses.

Worksheet #6(b)
(standard calculation form)
Calculating Dollar Savings from Hot Water Efficiency

Year	Price /a/	Energy Savings	Dollar Savings
1			/b/
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
Total:			/c/

NOTES:

/a/ The future stream of revenue here has not been discounted. The process of taking the non-discounted revenue as the basis for calculating future value is appropriate provided that the projected rate of growth in price is equal to the expected rate of the discount.
/b/ Column 1 x Column 2
/c/ Sum of Column 3

Worksheet #7(a)
(Illustration)
Financial Impact of Energy Efficiency Investment
on First Time Home Buyer

	Monthly Mortgage	Monthly Utility	Total Shelter	Monthly Savings
Pre-Energy Efficiency	$531 /a/	$194 /b/	$725	xx
Post-Energy Efficiency	$559 /c/	$92 /d/	$651	$74

Effective Discount on Purchase Price			Effective Discount on Interest Rate	
Purchase price:	$77,556		Actual Interest Rate	7.63%
Mortgage:	$74,361		Present value w/o efficiency /e/	$108,694
Present value efficiency savings:	$14,319		Present value w/ efficiency /f/	$95,955
Effective purchase discount:	18%		Effective interest	6.32%
			Interest discount	1.31%

NOTES:

/a/ The average mortgage in the New Hampshire mortgage revenue bond program is $74,361.
/b/ The pre-audit electric and natural gas energy cost was $2,328.
/c/ The installed cost was $3,923, which would be added to the mortgage.
/d/ The post-audit electric and natural gas energy cost was $1,102.
/e/ Present value of mortgage plus utility payments.
/f/ Present value of mortgage plus utility payments.

Worksheet 7(b)
(standard calculation form)
Financial Impact of Energy Efficiency Investment
on First Time Home Buyer

	Monthly Mortgage	Monthly Utility	Total Shelter	Monthly Savings
Pre-Energy Efficiency	$	$	$ /c/	xx
Post-Energy Efficiency	$ /a/	$ /b/	$ /c/	$ /d/

Effective Discount on Purchase Price		Effective Discount on Interest Rate	
Purchase price:	$	Actual Interest Rate	%
Mortgage:	$	Present value w/o efficiency	$
Present value efficiency savings:	$	Present value w/ efficiency	$
Effective purchase discount:	% /e/	Effective interest	% /f/
		Interest discount	% /g/

NOTES:

/a/ Increased to take into account amount of financed energy efficiency improvement.
/b/ Decreased to take into account energy efficiency savings.
/c/ Column 1 + Column 2
/d/ (Pre-efficiency total shelter) - (Post-efficiency total shelter)
/e/ Present value efficiency savings / purchase price
/f/ Interest rate needed to make present value w/o efficiency = present value w/ efficiency.
/g/ (Actual interest rate) - (Effective interest rate)

SECTION 2: THE LENDER'S PERSPECTIVE

Showing that the linked deposit energy efficiency program is beneficial to the lender provides a second pillar of support for the proposed lending program. The benefits to the lender are considered from two different perspectives below:

(1) As though the lender is making a direct loan to the consumer for a home purchase; and

(2) As though the lender is making a loan to an institution to provide rental housing.

Heating Costs and Overall Shelter Affordability

Taking account of energy costs is crucial to any consideration of the affordability of shelter to low-income households. Energy costs, standing alone, can often drive total shelter expenses beyond affordable levels.

Energy costs, standing alone, can often drive total shelter expenses beyond affordable levels.

One study of winter natural gas home heating bills found that more than 2.7 million low-income gas heating households nationwide would have winter home heating burdens exceeding 10 percent of income. More than 1.0 million households with incomes less than $6,000 would have winter natural gas home heating burdens exceeding 30 percent of their income.

Electric Costs and Overall Shelter Affordability

A separate study of the "other part of the year" found that:

- Even modest amounts of summer electric consumption (500 kWh per month) exceeded 10 percent of income for 162 of the 185 electric companies studied.
- 88 companies imposed burdens exceeding 15 percent of income on their low-income consumers.

Even at 500 kWh of summer electric consumption, none of the companies imposed burdens on their low-income consumers of five percent or less, the ceiling of electric affordability.

Improving the "Bankability" of Home Buyers

Because of these significant impacts of energy bills on overall shelter affordability, the installation of energy efficiency measures should improve the "bankability" of low income consumers from the perspective of the lender. The installation of energy efficiency measures will reduce energy bills and thus increase the income available to make mortgage payments. The same is true for rental payments owed by tenants.

Because of the significant impacts of energy bills on overall shelter affordability, the installation of energy efficiency measures should improve the "bankability" of low income consumers from the perspective of the lender.

From the perspective of the lender, energy efficiency will increase the bankability of a consumer. The "bankability" of a consumer refers to the amount of financing the home buyer is eligible for using standard underwriting criteria.

The lower the income of the home buyer, the greater the impact that energy efficiency has on stretching underwriting ratios. Reducing home energy bills by $300, in other words, is "more important" to a person with an income of $12,000 than it is to a consumer with an income of $22,000.

Considering Front-end Ratios

As a general rule, the consumer would be allowed to incur debt financing of up to 28 percent of his or her income before considering expenses (front-end ratio) and up to 36 percent of his or her income after a consideration of expenses (back-end ratio).

Lenders often "stretch" these ratios somewhat for first time home buyers. In 1993, for example, Fannie Mae agreed to buy first time home buyer loans supported by housing cost ratios of up to 33 percent.

The lower the income of the home buyer, the greater the impact that energy efficiency has on stretching underwriting ratios.

Historically, total shelter expenses have been limited both in what they include and in what conventional lenders will approve through loan underwriting. The shelter (or housing) expenses that go into calculating this ratio include what is commonly referred to as P.I.T.:

Principal

Insurance

Taxes

Increasingly, however, lenders are recognizing the energy component of shelter expenses and are thus moving to a PIT-E calculation (Principal, Interest, Taxes and Energy).

Energy efficiency can substantially improve the PIT-E ratio used in underwriting. Assume that the home buyer has an annual gross income of $16,000 (monthly income of $1,333) and the following monthly shelter expenses:

Principal:	$280
Insurance:	$ 30
Taxes:	$100

The consumer would have a shelter cost ratio of 31 percent ($410 / $1,333 = 0.31).

If the consumer could eliminate 20 percent of a $1,500 annual home energy bill by financing $2,000 energy efficiency at conventional interest rates, the consumer would have eliminated sufficient expenses to effectively bring the P.I.T. ratio down to 30 percent.

Considering Back-end ratios

Similar results arise in a consideration of back-end ratios. Conventional underwriting guidelines provide that a consumer's long-term debt, including monthly housing expenses, should not exceed 36 percent of gross monthly income.

The 36 percent figure, however, is only a guideline. Most lenders will consider loans in excess of this figure when particular circumstances dictate in favor of such a decision.

In addition, many lenders will "stretch" this ratio for first time home buyers. In 1993, for example, Fannie Mae agreed to buy first time home buyer loans supported by debt-to-income ratios of up to 38 percent (or more).

Improving the Bankability of Rental Property

Reductions in energy costs help improve the bankability of rental property as well. Energy efficiency will have positive impacts on the financial viability of rental properties which loan officers will view favorably. Included are reduced vacancy losses, reduced "churn," increased marketability, and reduced future risk.

Reducing Vacancy Losses

A reduction in vacancy losses is one of the major sources of financial benefit that lenders will view with favor for an energy efficient rental unit. Expensive to heat apartments impose unique costs on housing owners, developers and managers. Expensive to heat apartments have high vacancy rates.

It is not uncommon, for example, for households to live in an apartment during the winter months, only to move when winter-incurred arrearages come due in the spring. Making these apartments *less* expensive to heat thus makes them more attractive and less subject to vacancy. The reduction in vacancies results in reduced cash losses due to vacancies.

> Low-income tenants cited high energy bills as a "substantial contributor" to the decision to move even in instances when the tenant was not behind on his or her bill.

Decreasing Long-Term Risks

The "churn" in tenants will also be reduced. Recent research into the cause of "frequent mobility" amongst low-income consumers found that unaffordable home energy bills frequently contributed to the tenant's decision to move. Low-income tenants cite high energy bills as a "substantial contributor" to the decision even in instances when the tenant was not behind on their bill. More than half of tenants who had moved more than twice in the past two years or more than three times in the past three years cited unaffordable home energy bills as a reason for their decision to move.

Energy costs tend to increase far more rapidly than either housing costs or the Consumer Price Index (CPI-U). As a result, energy costs represent a long-term threat to the financial sustainability of low-income housing development.

Even if housing sold with an affordable mortgage (or rented at affordable rents), increasing energy costs may ultimately make total shelter costs unaffordable thus placing rent or mortgage payments in jeopardy.

Unaffordable Energy and Shelter Habitability

Low-income consumers who face the disconnection of service due to an inability-to-pay represent a financial threat to owners/operators of low-income housing (and the institutions who loan to them). A housing unit without energy services, even if the rent or mortgage payments are affordable, is deemed to be an uninhabitable unit under most affordable housing laws.

Recent research has found that between five and seven percent of low-income consumers face the disconnection of service due to nonpayment each year. Decreasing this long-term risk of default or uninhabitability, therefore, through the installation of energy efficiency measures today will be of substantial benefit to developers as developers.

Moving Capital Costs to the Operating Budget

The underwriting ratios upon which most lenders rely for their financing decisions focus on the long-term debt incurred by the consumer. In this sense, "long-term debt" involves those loans that have a term exceeding ten months.

Through investment in energy efficiency measures, much of the investment in energy-related measures can be moved off balance sheet and out of the capital budget.

Through investment in energy efficiency measures, much of the investment in energy-related measures can be moved off balance sheet and out of the capital budget to the operating expense budget instead. In this fashion, for example, investments in space heating equipment, windows, insulation and the like can be taken out of the capital budget altogether. In so doing, both the front-end and back-end ratios of the development will be improved.

A Special Note on Rental Properties

Providing capital for energy efficient low-income rental housing should be given particular consideration. Because buildings are occupied by primarily low-income tenants, this financing is severely needed and difficult to obtain.

Low tenant income is generally accompanied by low rent rolls and low rents are generally only available in the older, deteriorated building stock. Antiquated and deteriorated building energy components and systems are inefficient and expensive to operate.

These economic conditions conspire to weaken the net operating income and cash-flow and future of the building as a source of habitable housing. The need for building improvements and the low profits from these buildings generate a serious need for financing from a lending institution. The effort required to obtain this low cost financing also adds to the proportional overhead expense of the financial packaging work involved in these deals.

The willingness of lenders to develop creative means of financing such energy improvements meets several further needs of the low-income community as well. These include the correction of substandard living conditions in households occupied by families of very low-income; and the alleviation of conditions of economic hardship *for the buildings* which contribute to their continued deterioration and eventual loss.

The willingness of lenders to finance energy efficiency improvements helps alleviate conditions of economic hardship *for the buildings* which contributes to their continued deterioration and eventual loss.

The uniqueness and value of the service provided by energy efficiency improvements goes far beyond the specific investment for energy improvements. The following features should also be noted:

- Investments are universally made in buildings that are presently occupied and salvageable;
- The low per unit level of expenditure enables the servicing of a large number of households per dollar of allocation;

- The work helps to economically stabilize the building by: (a) reducing building operating costs (energy, maintenance, etc.); and (b) improving the investment value (through appreciation and cash flow improvement);

Energy efficiency helps to economically stabilize a building by: (a) reducing building operating costs (energy, maintenance, etc.); and (b) improving the investment value (through appreciation and cash flow improvement).

- The work corrects hazardous and degrading living conditions suffered by these tenants; and

- The work tends, also, to be "preventative" in nature, thus helping to avoid the future costs resulting from building abandonment, homelessness, and consequent increased costs for major building rehabilitation.

SECTION 3: THE DEPOSITOR'S PERSPECTIVE

Showing that energy efficiency measures funded through linked deposits will generate positive benefits to the resident --homeowner or tenant-- is only part of the task. In addition, it is necessary to show that the linked deposit program can be pursued at a reasonable cost to the depositor. It is not necessary that the program be cost free. Indeed, given the write-down of interest rates, the program will likely *not* be cost free. It is necessary instead to show merely that the cost is reasonable in magnitude and delivers good value.

A variety of institutions can be approached with proposals to implement linked deposit programs. Institutions that show particular promise include:

- public utilities
- local governments
- insurance companies.

In addition, the interest of school districts in controlling the energy costs of low-income households is briefly described below.

Electric and Natural Gas Public Utilities

In this era of competition and deregulation within the public utility industries, providers of natural gas and electric service, both, seek ways through which they might minimize their costs of doing business. Energy efficiency directed toward low-income consumers offers one such way.

Two researchers for the Washington state energy office reported that traditional impact evaluations of low-income weatherization programs had neglected quantification of potential benefits beyond the mere energy savings. Observing that "low-income households often get behind in paying their bills," these researcher hypothesized that "reducing energy consumption in these households may set off a chain of impacts: lower, more affordable utility bills; fewer unpaid utility bills; lower past-due bills (arrearages); and ultimately, lower utility costs to process past-due accounts, and lower utility write-offs from uncollectible debts."

Further work found this early prediction to be true for all types of utilities:

- **Natural Gas:** Wisconsin Gas found that its program reduced the customers with $100 of annual arrears by nearly 300 percent. This company found that it received a 20 percent return on its weatherization investment, strictly from the reduced nonpayment, and before considering traditional avoided costs, in the first year of the program.

- **Electricity:** Niagara Mohawk found that while all low-income households in its energy efficiency program incurred new arrears, those who had received the weatherization services had fewer new arrears than those who did not.

- **Water:** The Philadelphia Water Department found that as water bills decline, or even are held steady, customers. . .do tend to put resources toward paying their bill off rather than just paying a smaller portion of the new bill.

Similar results were found by Columbia Gas, Central Maine Power Company, and Commonwealth Electric Company.

Energy efficiency directed toward low-income consumers has been found to yield benefits to utilities by:

- Reducing credit and collection costs
- Reducing uncollectible expenses
- Reducing working capital expenses
- Reducing regulatory expenses
- Increasing total revenue collected (even when bills decrease)

These benefits, which are above and beyond the benefits of the reduced expense of saving rather than producing energy, are even more significant in a linked deposit program where the energy efficiency expenditure is merely the interest write-down, rather than the entire cost of the installing an energy efficiency measure.

Local Municipal Governments

Low-income energy efficiency programs can beneficially be teamed with local government spending on a variety of programs. The goals of municipal financing of low-income energy efficiency can be viewed simply from the perspective of the municipal government, setting aside the positive social impacts for the moment.

A municipal government energy efficiency financing program can:

- Increase the efficacy of other municipal government programs, such as affordable housing development efforts.
- Ensure the coordination of various municipal government functions, such as housing, economic development, neighborhood redevelopment, social service provision, school programs, and so forth.

- Increase the "safety and soundness" of existing municipal government "investments" in social services, neighborhoods, housing, and the like.

- Preserve the municipality's housing base, along with the accompanying property tax base, sales tax base, and school finance base.

- Leverage substantial private resources in furtherance and support of municipal initiatives.

- Invest in the avoidance of future expenses associated with neighborhood decay, housing abandonment, and the like.

Insurance Companies

Insurance companies have a discrete vested business interest in promoting energy efficiency. This business interest can be used as the basis for a linked deposit proposal in support of energy efficiency in affordable housing. The business interest of insurance companies ranges from the global to the highly specific.

Lawrence Berkeley National Laboratory has found that since energy consumption is the largest contributor to global climate change, "promoting energy efficiency is a particularly promising strategy for the insurance industry" to reduce risk. According to LBL, the insurance industry "is becoming increasingly concerned about financial risks from natural disasters precipitated by global climate change," including windstorms, hailstorms, mudslides, wildfires, and flooding amongst others.

Substantial (and increasing) research has found that many energy efficient technologies can also reduce ordinary insured losses involving property, health or liability. According to Berkeley Laboratory, "for the building sector, efficiency measures can reduce losses from fire, ice, wind and water damage; temperature extremes; business interruption; poor indoor air quality; and equipment performance problems.

In particular:

- Energy efficient windows help to retard the spread of fires in buildings;
- Efficient lighting fixtures has been found to eliminate an important fire hazard in the home;
- Duct sealing can help reduce health risks from carbon monoxide backdrafting from gas appliances, as well as health risks associated with molds and poor indoor air quality;
- Duct sealing can prevent the build-up of moisture and improve the long-term structural integrity of a building;
- Air sealing and insulation can help prevent water damage claims attributable to rooftop "ice dams."

School Districts

Unaffordable home energy bills significantly contributes to the "frequent mobility" of low-income families with children. This mobility occurs even if a family is not in payment trouble, either facing the disconnection of service or facing arrears.

In turn, substantial research ties the frequent mobility of children together with poor educational attainment. Frequent mobility is associated with:

- Children being below grade in reading
- Children being below grade in mathematics
- Children being more likely to drop out of school

One study finds that "elementary school children who move frequently face disruption to their lives, including their schooling. And, sadly, these children are often not helped to adjust to the disruption of a new school--new children, teachers, and principal--and to make sense of the variations in curriculum between the old school and the new."

Anther study found that "Teachers may. . .not have the time to identify gaps in such a child's knowledge; moreover, these gaps may grow as the child is left on his or her own to make sense of the new curriculum and its relation to the one at the previous school."

The Missouri study ultimately concluded: "Rather than simply having a variety of remedial education programs directed toward the frequently mobile student, perhaps the education system needs to take more care in directing referrals of these households to public and private energy efficiency programs, fuel funds, winter heating assistance programs, and the like. While the effort to make such referrals may seem beyond the purview of the school system at first glance, [this] study [shows] that poor educational attainment and unaffordable home energy may involve the same, not different, issues."

A linked deposit program capitalized by school system deposits could be one easy, and inexpensive, way for a school system to become involved.

SECTION 4: THE LINKED DEPOSIT TRANSACTION

A linked deposit program is a special program using specific deposit arrangements (which often include reduced interest rates) to leverage specific types of loans and to target lending to a specified type of borrower by the institution receiving the deposit.

Linked deposit programs generally allow for discretionary funds to be deposited in a way to support programs of particular public benefit. These programs are often characterized by below-market interest rates, flexible terms, and careful targeting to specific credit needs. A well-designed linked deposit program not only encourages financial institutions to make loans for low-cost housing, agriculture, and economic development, but also enables these loans to be made at lower interest rates to the borrower.

Linked deposit programs rely on the mutual benefits arising to the depositor and the financial institution from pursuit of the lending program desired by the depositor. The program is based on a notion of a partnership between the depositor and the financial institution.

One summary of government-based linked deposit programs observes:

> Linked deposits are an easy-to-administer mechanism for bank-government partnerships aimed at expanding local business opportunities, improving neighborhood housing or assisting farmers. The `link' which gives the concept its name connects government funds deposited in a bank with the bank's promise to lend money to members of targeted groups.

The Linked Deposit Objective

An effective linked deposit program works by encouraging private financial institutions to seek out unfamiliar under-invested markets. Moreover, a linked deposit program may be said to "work" if it results in increases in designated categories of bank loans in local communities.

The objective of governmentally-implemented linked deposit programs is to correct capital gaps that harm small business or other areas of the economy. According to the Government Finance Officers Association (GFOA), "state and local governments' linked deposit programs often seek to correct a shortage in available capital which has constrained the growth potential in a targeted area or among members of a targeted group."

GFOA observes: "At a time of budget deficits and cutbacks in expenditures, public deposits provide state and municipal governments and other public agencies with a means for pursuing public goals without collecting additional revenues."

The Outlines of a Linked Deposit Program

The broad outlines of a linked deposit program include the following components:

1. A depositor institution places long-term deposits with a lending institution.

2. The deposits include purchases of certificates of deposit, or other financial instruments negotiated by the respective institutions.

3. The depositor institution agrees to accept a return (often set at four percent) below the market rate of return otherwise available on a deposit of similar risk and term.

4. In return for accepting below market interest rates, the financial institution agrees to lend these deposits to designated types of borrowers for designated purposes, with a direct passthrough of the lower interest rate.

5. As part of the loan process, the financial institution agrees to waive traditional underwriting criteria for the extent of the loan made through the linked deposit program, including, but not being limited to, loan-to-value ratios.

A model linked deposit question and answer proposal is included as Appendix B. Similarly, a model linked deposit proposal is attached as Appendix C. Finally, a model linked deposit agreement between a financial institution and a depositor is included as Appendix D.

Advantages of a Linked Deposit Program

Both government associations who have examined linked deposit programs --these include the National Association of State Treasurers and the Government Finance Officers Association-- have noted the ease of administration as one of the primary advantages of such programs.

> Perhaps the primary attraction of linked deposits for the states is the relative ease with which such a program may be implemented.
>
> *National State Treasurers' Association*

According to the State Treasurers' examination of state linked deposit programs directed toward small business and agriculture, "perhaps the primary attraction of linked deposits for the states is the relative ease with which such a program may be implemented."

According to the State Treasurers' Association: "In a typical linked deposit program, the state treasurer purchases certificates of deposit from eligible banks using state funds designated by the legislature. The financial institution, in turn, lends those funds to borrowers who meet eligibility criteria. In exchange for a lowered rate of return on the state's deposit, the bank agrees to charge a lower interest rate on linked deposit loans to borrowers."

According to the GFOA: "Linked deposits are just one of many innovative economic development financing programs, but they are among the easiest to administer. The paperwork is minimal and the program can be managed almost routinely within the treasury's investment function. The government does not determine the creditworthiness of loan applicants and in some programs does not review individual loans."

> Linked deposits are among the easiest innovative financing programs to administer. The paperwork is minimal and the program can be managed almost routinely within the treasury's investment function.
>
> *Government Finance Officers Association*

GFOA continued: "The linked deposit technique works without altering the relationship between borrower and lender. The bank evaluates linked deposit loan applications according to its usual procedure, and the bank retains the default risk associated with personal or commercial loans. The role of the governmental participant is merely to provide the capital for the bank to lend."

GFOA concluded: "Linked deposit agreements do little to change the public investment function. Common investment instruments are employed (certificates of deposits in most cases), and standard transfer processes and collateral requirements are appropriate."

The Flexibility of Linked Deposits

Linked deposit programs are often noted for their flexibility in meeting the capital needs of the population or sector of the economy to which they are targeted. The state of Indiana, for example, in a program directed toward drought-stricken farmers, required financiers to waive the traditional debt-to-worth and net worth levels.

The flexibility of a linked deposit program is demonstrated by the innumerable forms such a program may take. Generally, a special linked deposit is requested of the state treasurer by the specific bank. The request will describe the proposed loan or loan program, including the types of loans to be made, the term, points, fees, and interest rate to the borrower.

The bank requests a deposit from the state treasurer at a particular rate and term with appropriate collateralization. The bank describes how the public deposit is needed in order to make the loan or loan program work. This system may result in a wide variety of "linked deposit" loan programs offered by different banks.

Not only the terms to the borrowers can be flexible, but the terms on which the deposit is made can be flexible as well.

Not only the terms to the borrowers can be flexible, but the terms on which the deposit is made can be flexible as well. For example, there is often flexibility as to the term of the deposit, thereby allowing the state treasurer to take deposits for longer periods which can serve as an incentive for financial institutions to participate in a linked deposit program. Stable state deposits have allowed participating financial institutions to substantially reduce the interest rate on the loan, and thus the total development cost to the borrower.

Calculating the Cost of a Linked Deposit Program

In calculating the cost of a linked deposit program to a depositor -- whether a city, a public utility, an insurance company or someone else-- it is important to remember that the amount of the investment in low-income energy efficiency committed through the linked deposit program is *not* the value of the deposits placed with the lender. The deposit, itself, does not represent an "expense" of the institution. The deposit is an investment just like any other investment, whether in certificates of deposit, stocks or bonds, or some other type of financial instrument.

Instead, the expense is the value of the reduced return that the depositor receives by placing its money through a linked deposit program rather than through whatever investment it would have instead made in the program's absence. The costs of a linked deposit program flow, in other words, from the lesser interest that is accepted in exchange for the financial institution providing below-market rate loans to the targeted sector of the economy.

According to the report for the National Association of State Treasurers, "in exchange for a lowered rate of return of the state's deposit, the bank agrees to charge a lower interest rate on linked deposit loans to borrowers. This spread is usually around 3% - 4% below prevailing market rates."

Since placing a deposit will generate lost interest over the life of the deposit, the total low-income energy efficiency investment is the present value of the lost interest arising from a deposit made in any given year. For each year in which a new deposit is made, a net present value stream of lost interest will have to be calculated and cost-justified.

Worksheet 8 provide for the calculation of a linked deposit expense to a potential depositor. This worksheet assumes that Ourtown places a linked deposit of $525,000 a year with financial institutions serving low-income housing developers. This amount permits 150 units of new or rehabilitated housing to be improved with energy efficiency investments of up to $3,500 per unit.

As discussed above, it is not the $525,000 which is the Ourtown investment. Instead, the $525,000 is simply a deposit of funds. Instead, it is only the foregone interest which represents the Ourtown energy efficiency investment.

Assuming an interest rate write-down of four percent (4%), the first year cost of the linked deposit program would be $21,000. Assuming a ten year deposit, and a seven percent (7%) discount rate, the total net present value energy efficiency expenditure from each year of additional deposit would be $147,495.

The length of the deposit, as discussed above, is subject to negotiation.

The Role of Risk in a Linked Deposit Program

Little or no risk would attend a linked deposit program for a depositor institution in this regard. Through such a program, the depositor becomes an investor/depositor in a financial institution.

Within the context of state programs for agriculture and small business, the evaluation for the National Association of State Treasurers found that "linked deposits incur *no* state risk because banks are required to collateralize or otherwise secure state deposits." The state purchases certificates of deposit to be used for a targeted loan.

Little or no risk would attend a linked deposit program for a depositor institution. Regardless of the success and failure of any particular loan, interest earned on deposits is due at maturity.

The bank is responsible for the exercise of good judgment beyond program strictures. Furthermore, regardless of the success and failure of any particular loan, interest earned on state deposits is due at maturity.

Matching Linked Deposits with the Needs of the Developer

The flexibility in a linked deposit program can be exercised with respect to the lender's relationship with the developer as well as with the depositor. As discussed above, perhaps most importantly, a loan for cost-effective energy efficiency improvements, made through a linked deposit program, can be provided:

- Without further credit qualification of the borrower; and
- Without further appraisal of the property.

In this way, the lender takes into account the financial savings generated by the energy efficiency investment whether or not the traditional underwriting criteria would do so. Providing funds in this fashion is consistent with the Federal Housing Administration's Energy Efficient Mortgage (EEM) program for single family home buyers.

In addition, loans made to housing developers through a linked deposit program might have the following attributes:

- A waiver of interest in the early years of a housing development. These are the years, developers say, where the finances of a project are most constrained;
- Variable interest rates based on occupancy in new developments. Such rates assist the developer to meet early financial obligations;
- "Shared savings" repayments, where the repayment of principal and interest is made, in whole or part, a function of the energy savings that are generated via a non-energy efficiency baseline. These shared savings arrangements can be limited to the early years of the development, to *ensure* that cash flows in the early years will be positive.

The purpose of the above is not to recommend the above structures, but to illustrate the ability of a linked deposit program to offer flexible arrangements between the lender and the developer.

Integrating Linked Deposits with the Home Buying Process

One aspect of an energy efficiency transaction that may worry parties to a home purchase transaction (whether it be lenders, developers, realtors or the consumer himself or herself) is the impact which the energy efficiency transaction will have on the overall purchase transaction.

As Flow Chart 1 below demonstrates, the process of auditing a home for energy efficiency, finding an energy efficiency contractor, and installing the energy efficiency measures, does not slow down any part of the overall home purchase transaction. Importantly, as Flow Chart 1 shows:

- The decision on whether or not to grant financing to the home buyer is not affected by the energy efficiency transaction;
- The closing of the sale is not affected by the energy efficiency transaction;
- The clearing and closing of any escrow not related to the energy efficiency improvement is not affected by the energy efficiency transaction.

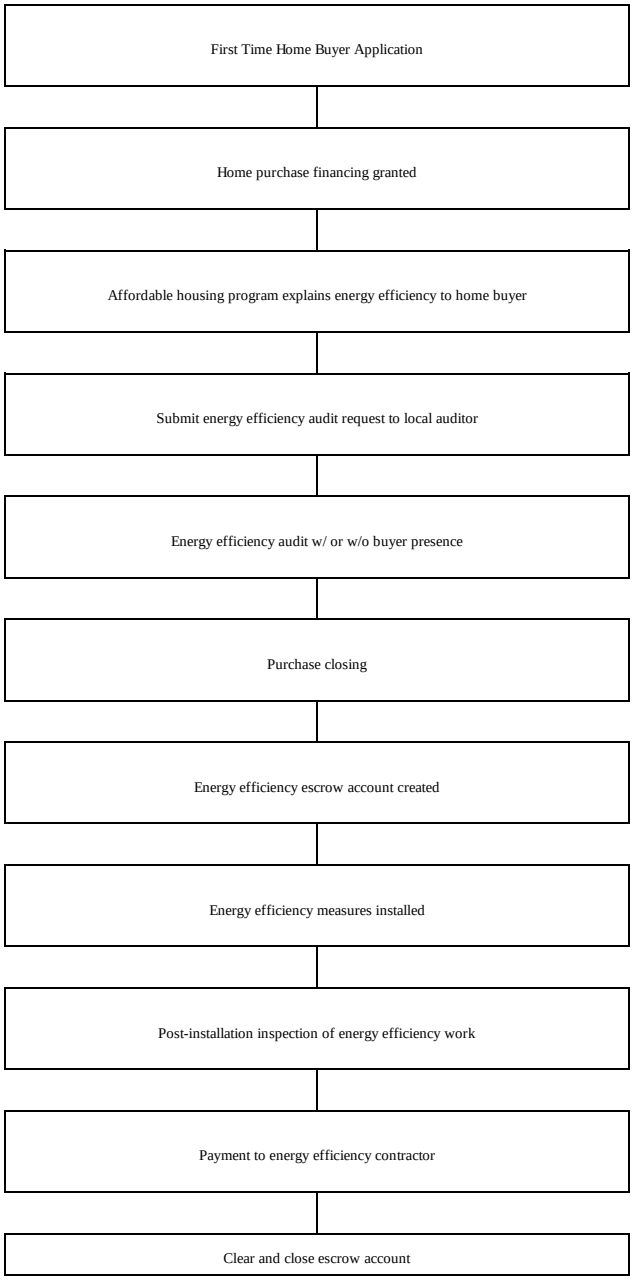
Articulating the Responsibilities of all the Parties

The energy efficiency financing transaction can be structured to fit in with each step of the home buying process. This is true whether the financing is provided through a linked deposit program, through conventional financing, or through some type of energy efficient mortgage (EEM) program.

The final aspect of a linked deposit financing transaction involves the extent to which, if at all, various parties to the transaction will undertake new (and potentially complex) responsibilities.

Flow Chart 2 presents the various activities that are necessary to implement an energy efficiency program within the context of affordable housing development.

FLOW CHART 1:
INTEGRATING ENERGY EFFICIENCY WITH A FIRST TIME HOME BUYER PROGRAM



FLOW CHART 2:
ENERGY EFFICIENCY IN AFFORDABLE HOUSING PROGRAMS

Activity	Performed By	Notes
Establish First Time Home Buyer (FTHB) Eligibility / Participation Criteria	First Time Home Buyer (FTHB) Program	No difference from existing program.
Take application for FTHB program	Housing Agency / Financial Institution	No difference from existing program.
Impose requirement for energy efficiency audit	Financial Institution / FTHB Program	No different from radon tests, lead paint test. May simply market.
Perform energy efficiency audit / Identify cost-effective measures	Local energy efficiency contractor	Will likely be low-income weatherization agency.
Provide home buyer counselling after energy efficiency audit report.	Local energy efficiency contractor	Explains potential costs / benefits of identified efficiency measures.
Provide debt financing for energy efficiency measures	Financial Institution	Lender capital provided through linked deposit program.
Close purchase	Home Buyer	No difference from existing program.
Escrow energy efficiency financing until measures installed	Financial Institution	Financial institutions frequently do escrows (*e.g.*, HUD 203(k) loans).
Install energy efficiency measures	Local energy efficiency contractor	Likely to be local low-income weatherization agency.
Inspect final installation and certify completion.	Arranged by lender	No different from HUD compliance inspections.
Clear escrow	Financial institution.	Amount in excess of contractor payment paid against loan principal.
Service energy efficiency loan	Financial Institution	As part of underlying loan that would be served in any event.
Provide recourse if loan defaults	Secondary market	Energy efficiency loans may be purchased by FHA, FNMA, etc.

Worksheet #8(a)
(Illustration)
Calculating the Annual Cost of a Linked Deposit Program

Year				Below Market Linked Deposit Interest			Difference
	Deposit	Interest Rate	Annual Return /a/	Deposit	Interest Rate	Annual Return /a/	
1	$525,000	0.075	$39,375	$525,000	0.035	$18,375	$21,000
2	$525,000	0.075	$39,375	$525,000	0.035	$18,375	$21,000
3	$525,000	0.075	$39,375	$525,000	0.035	$18,375	$221,000
4	$525,000	0.075	$39,375	$525,000	0.035	$18,375	$21,000
5	$525,000	0.075	$39,375	$525,000	0.035	$18,375	$21,000
6	$525,000	0.075	$39,375	$525,000	0.035	$18,375	$21,000
7	$525,000	0.075	$39,375	$525,000	0.035	$18,375	$21,000
8	$525,000	0.075	$39,375	$525,000	0.035	$18,375	$21,000
9	$525,000	0.075	$39,375	$525,000	0.035	$18,375	$21,000
10	$525,000	0.075	$39,375	$525,000	0.035	$18,375	$21,000
Net Present Value (7% discount)							$147,495

NOTES:

/a/ The annual return remains the same for the entire ten year term. The deposit does not get repaid as the loan gets repaid. Instead, the deposit remains with the lender for the full ten year term.

Worksheet #8(b)
(Standard Calculation Form)
Calculating the Annual Cost of a Linked Deposit Program

Year				Below Market Linked Deposit Interest			Difference
	Deposit	Interest Rate	Annual Return /a/	Deposit	Interest Rate	Annual Return /a/	
1		/b/	/c/		/d/	/e/	/f/
2							
3							
4							
5							
6							
7							
8							
9							
10							
Net Present Value (___% discount) /g/							$

NOTES:

/a/ The annual return remains the same for the entire ten year term. The deposit does not get repaid as the loan gets repaid. Instead, the deposit remains with the lender for the full ten year term.
/b/ Market rate interest.
/c/ Column 1 x Column 2
/d/ Market rate interest minus negotiated interest rate discount.
/e/ Column 4 x Column 5
/f/ Column 3 minus Column 6
/g/ The net present value depends on the choice of an appropriate discount rate.

SECTION 5: POTENTIAL LINKED DEPOSIT HOUSING PARTNERSHIPS

There is substantial potential for energy efficiency programs to enlist housing programs as partners in a shelter-based linked deposit energy efficiency initiative. The discussion below will identify some potential partners, without ever purporting to represent a comprehensive list.

Minimizing Lost Opportunities

Linked deposit programs should be targeted low-income housing developers in an effort to minimize lost opportunities for low-income energy efficiency improvements in such initiatives. Lost opportunities arise when the accomplishment of some given task precludes the future accomplishment of additional work at that same dwelling.

Decisions made by low-income housing developers represent decisions that will hold for the useful life of the measures. Accordingly, if a developer installs a relatively inefficient furnace or hot water heater, or fails to install the most cost-effective level of insulation, it is not likely that a utility will soon revisit that home to install more energy efficient measures. The opportunity to install high efficiency measures is lost at the time of the developer's initial decision.

Similarly, a failure to finance and install energy efficiency at the time of home purchase will likely represent a lost opportunity in a first time home buyer context. Certain transactions lead residential customers generally, or low-income residential customers in particular, to focus their attention on housing costs. The purchase or refinancing of a home, for example, is one such transaction. If that attention can be harnessed at the time it is focused on the home, the likelihood of making energy efficiency improvements increases. If, however, the purchase or refinancing transaction passes by, it is not likely that it will be easy, or even possible, to direct future attention to energy efficiency matters, particularly if the energy efficiency would require some type of debt financing.

State Mortgage Revenue Bond Programs

State Housing Finance Agencies (HFAs) provide considerable assistance in promoting first time homeownership. By 1991, of the 600 affordable housing programs operated by HFAs around the country, 225 were homeownership programs. According to the National Council of State Housing Agencies, the Mortgage Revenue Bond (MRB) Program is the primary homeownership program operated by State HFAs.

Under a Mortgage Revenue Bond program, state housing finance agencies (HFAs) issue tax-exempt bonds and use the proceeds raised from investors to fund mortgages through private lenders to lower income, first-time homebuyers purchasing modest-priced houses. In general, MRB borrowers may not have incomes higher than 100% or 115% of the area or state median household income, whichever is greater. The average MRB loan goes to buyers at or below 80% of the national median income. In addition, MRB loans may only be used to buy homes costing no more than 90% of the average area purchase price.

The Council reports that from the program's inception through 1992, state HFAs had assisted more than 1.6 million lower income American homebuyers through the MRB Program. More specifically, "in 1990, State HFAs made more than 131,000 MRB loans to borrowers with an average income of $28,568, approximately 80% of the national median family income of $35,700. The level was well below the average income of $44,500 for homebuyers with conventional mortgages purchasing their first home and the average income of $53,000 for all conventional buyers."

Home Investment Partnership Program (HOME)

One of the primary housing development, and homeownership, programs by the federal government is the Home Investment Partnerships Program (HOME). Created in 1990, the HOME program is a federal housing block grant, which provides funds to states and localities to undertake flexible, wide-ranging housing activities through partnerships among states, localities, private industry and non-profit corporations. Funds are distributed using a needs-based formula, and activities are targeted at a minimum to those with incomes below 80 percent of area median income.

While much of the HOME money goes to rehabbing rental and owner-occupied properties, a significant portion goes to First Time Home Buyer (FTHB) assistance as well.

Community Reinvestment Act (CRA) Lending

Notwithstanding the considerable attention devoted to financing housing development through bank Community Reinvestment Act (CRA) programs today, very little attention is devoted to including financing for energy efficiency in such efforts. This lack of attention results in missed opportunities for literally thousands of homeowners a year.

Under the federal Community Reinvestment Act (CRA), local banks have imposed upon them a responsibility to meet local community credit needs. These needs most often involve providing credit for affordable housing, including homeownership for low and moderate income households. The potential for reaching low- and moderate-income households through CRA financing is substantial.

The CHOP initiative of Norwest Bank in Colorado is illustrative. In response to its community reinvestment responsibilities, Norwest Bank Colorado (NA) operates its Community Homeownership Program (CHOP). Introduced in 1991, CHOP first involved a commitment to make available $20 million in loans to encourage home ownership by low-to-moderate income individuals and families. In 1992, the program was expanded throughout Colorado and the amount available was increased to $40 million. In 1993, the program was expanded to address the home ownership needs of disabled individuals.

Since the CHOP program began in 1991, the amount available has grown to $100 million. Through December 1994, Norwest had approved 1,500 CHOP loans totaling more than $70 million statewide.

This single illustration from Colorado is not extraordinary. In six Midwestern states alone, banks have publicly announced nearly six *billion* dollars worth of CRA lending since 1977. In addition, much more CRA lending occurs without public acknowledgement of the CRA inducement.

Neighborhood Reinvestment Corporation

Not all First Time Home Buyer programs are government-sponsored initiatives. One of the primary private (or quasi-private) initiatives involves the Neighborhood Reinvestment Corporation (NRC) through its local Neighborhood Housing Services/NeighborWorks offices.

Neighborhood Reinvestment, a Congressionally-funded nonprofit organization, serves as the national partner to the 180 local NeighborWorks organizations. Most of these organizations bear Neighborhood Housing Services somewhere in their name. Their mission is the renewal of distressed neighborhoods, frequently using the retention and increase in home ownership as a principal strategy.

In recent years, over 16,000 homes are affected each year. More than half of these involved minor repairs including weatherization. Of the remaining homes, the vast majority had either major rehabilitation or were existing homes purchased by a new homeowner with the aid of the NeighborWorks organization.

According to Neighborhood Reinvestment data, of the first time home buyers the organization assisted, 29 percent pay less for owning a home than they previously paid for renting; 70 percent earn incomes of less than $30,000 a year. The median household income was $24,000. More than 40 percent of Neighborhood Reinvestment home buyers involve female-headed households (compared to 16 percent nationwide), and more than 60 percent are minority buyers (compared to 15 percent nationwide).

Federal Programs

The number of units of low- and moderate-income housing, the affordability of which might be improved by an energy efficiency linked deposit program, could involve a strong partnership between the federal government and various municipalities. Consider the following federal programs affecting the supply of affordable housing in our communities:

Foreclosed Multifamily Projects

- HUD's inventory of *foreclosed multifamily properties* is a second area where utilities might have access to targeting low-income assistance. HUD's inventory of foreclosed multifamily properties is substantial. The inventory grew from 10,000 units in 1990 to 27,000 units in 1992. By the beginning of Fiscal Year 1993, HUD initiated foreclosure on another 42,000 units, resulting in a total inventory of more than 69,000 units that are either HUD-owned or under foreclosure. Of these 69,300 units, at 441 properties, the law requires that roughly 31,200 be preserved as affordable low-income units. Similar properties are available through RHCEDS.

Foreclosed Single Family Homes

- HUD's inventory of *foreclosed single family homes* is another source of housing to which utility energy efficiency efforts might be targeted. As of the summer of 1994, HUD had roughly 30,000 foreclosed single family homes for sale. Similar foreclosed properties are available through RHCEDS.

Section 8 Multifamily Properties

- *Section 8 Multifamily Needs Assessments*, as required by federal law, will help identify low-income rental housing owners and managers with whom utilities can work. Under the Housing and Community Development Act of 1992, owners of older, assisted multifamily properties are required to submit comprehensive needs assessments to HUD. Each assessment must contain a description of the current and future financial or other assistance needed to ensure that the property is well maintained and financially viable. The assessment must also describe any resources available for meeting the current and future needs of the property and the likelihood of obtaining these resources. HUD provides Section 8 rental assistance to roughly 20,000 privately owned properties. The mortgages for about 10,000 of these properties are also insured or held by HUD.

Low-Income Housing Tax Credits

- Federal *Low-Income Housing Tax Credits* are also used to help finance the construction or rehabilitation of affordable housing throughout the country. First created by the Tax Reform Act of 1986, the Tax Credit requires that housing be geared to incomes at 50 or 60 percent of area median income. In 1993, the total tax credits available for allocation was $546 million, $425 million (78%) of which was actually allocated for low-income housing projects. From 1987 through 1992, states placed more than 267,000 total units in service using low-income housing tax credits.

State and Local Programs

In addition to these federal efforts, much *non*-federal housing development work occurs through state and local institutions, both public and private.

In general, state activity in the provision of affordable housing has been dramatic. Before 1980, only 44 state-funded housing programs existed. From 1980 to 1987, however, an additional 112 programs were created and from 1988 through early 1990, an additional 65 programs were developed. Most of these programs are for special needs populations, or involve new construction and substantial rehabilitation. A growing number of homeowner assistance programs are being created.

Local Community Development Loan Funds

- Local *Community Development Loan Funds* finance significant housing development. By 1993, 41 CDLFs existed in the country, with a total capitalization of $100.1 million. These institutions provided roughly $450 million in loans from 1986 through 1992, 44 percent of which went for affordable housing development. From 1986 through 1992, CDLFs financed 18,476 housing units, 86 percent of which were "permanently affordable" and 87 percent of which were affordable to low-income tenants. Each year, CDLF investments have grown, from $20 million in 1986 to $120 million in 1992. Moreover, CDLF lending from 1986 through 1992 leveraged an additional $1,678 million in funds, a 14:1 leveraging ratio.

State Housing Trust Funds

- State *Housing Trust Funds* represent permanent capital pools that offer a continuing source of financial assistance to support the creation and preservation of affordable housing. As of 1993, 37 states and the District of Columbia had housing trust funds.

  One estimate is that these funds have collectively provided more than $780 million in funding for 80,000 housing units, and have leveraged more than $2.25 billion in funding from other sources.

  Given that 14 of the 35 trust funds had been created in the three years preceding 1993, it is likely that the rate of investment, as well as the rate and amount of leveraged funds, will increase. Generally, state housing trust funds function as revolving loan funds, making loans and recycling loan repayments to make additional loans.

First Time Home Buyer Programs

First time homeowner programs can be divided into two types: (1) those run by government; and (2) those run by private institutions. Each will be considered separately.

Clearly, this discussion is not intended to be a comprehensive review of such programs. It is instead intended to provide a sufficiently complete list to allow public and private managers of energy efficiency programs to gain an idea of the genres of programs to which an energy efficiency component might be attached.

In addition to the Mortgage Revenue Bond program discussed above, several states provide assistance on downpayments and closing costs. Examples of these programs include:

- Alabama's "Down Payment Assistance Program," which provides a non-interest bearing second mortgage for up to 50 percent of the downpayment to households with incomes less than $23,600 and liquid asset under $3,000.

- Iowa's "Individual Home Acquisition Program," which provides grants, closing costs, and downpayment assistance and loan processing. The HAP is directed to households living at or below 80 percent of area median income.

- The Massachusetts "Borrower Assistance Program," which assists borrowers pay the closing costs associated with getting a mortgage. Buyers can borrow the lesser of $5,000 or five percent of the purchase price of the home. The interest, three percent, is deferred and repaid at the time of resale, refinancing, or transfer of the property.

- North Dakota's "Downpayment and Closing Cost Assistance Program," which lends up to $2,000 to households with incomes not to exceed $20,000.

- Pennsylvania's "Closing Cost Assistance Program," which provides a no-interest second mortgage of up to $2,000. The program is available to households who are at or below 75 percent of the area median income and who would have less than $1,200 in liquid assets remaining after closing.

- South Dakota's "Single Family Down Payment Assistance Program," which provides low-interest loans for the lesser amount of 50 percent of the buyer's downpayment and closing costs or $2,000. This program is directed toward low- and moderate income households.

As is evident, there are a wide variety of state-government programs directed toward promoting homeownership by low- and moderate-income households today. Some programs are intended to help overcome the initial costs of home purchases. Other programs are directed toward longer-term affordability. All represent potential linked deposit partners.

Private First Time Home Buyer Programs

A variety of local and private first-time homeowner programs exist today that are backed by institutional investors ranging from financial institutions to religious organizations to large scale public and private pension plans. Consider that:

- The AFL-CIO reported in 1993 that its Housing Investment Trust fund (HIT) had produced 3,000 units of affordable housing in 1992 alone. The AFL-CIO announced a program in 1993 that "will invest $660 million in housing and community development projects in 27 cities over the next five years."

Amongst the impacts of this initiative, the AFL-CIO said, would be the production of 10,000 to 12,000 units of affordable housing. Since that time, the Minneapolis newspapers have reported a program "to build an estimated $60 million in affordable housing and commercial space in the Twin Cities through 1998." Detroit papers reported that that city would get about $40 million in housing construction, or about 450 units. Los Angeles was to receive about $75 million in low- and moderate-income housing units.

Other targeted cities include Atlanta, Boston, Columbus (Ohio), Dallas, Miami, New York, Philadelphia, Pittsburgh, San Antonio, St. Louis, Washington D.C., Baltimore, Chicago, Cleveland, Denver, Milwaukee, New Orleans, Oakland, Phoenix, Portland (Oregon), Seattle and St. Paul.

- In 1994, the National Training and Information Center (NTIC) entered into a $25 million first time homeowners program in Chicago. NTIC, in conjunction with Neighborhood Housing Services of Chicago (NHS) and Freddie Mac, will develop a program focused on the renovation of 700 two-to-four unit properties with five local lenders. In addition to providing downpayment and closing cost assistance, NTIC will provide pre- and post-purchase buyer counselling.

APPENDIX A: ENERGY SAVINGS FROM EFFICIENCY IMPROVEMENTS

ATTIC INSULATION

The energy savings from increasing attic insulation should be calculated through a two-step process. The energy loss through a particular area can be calculated using Equation A-1 below. Equation A-1 should, therefore, be exercised twice. The first time involves data input without the energy efficiency improvement. The second time involves data input with the energy efficiency improvement. The difference between the two results is the energy savings attributable to the efficiency improvement.

A-1 $$(A \times HDD \times 24) / R = Btu/HR$$

WHERE:

A = area to be insulated

HDD = Heating degree days

24 = hours in day

R = R value of insulation

HOT WATER UPGRADE

The energy savings from increasing the efficiency of a domestic hot water heater should be calculated through a two-step process. The energy consumption of a particular domestic hot water heater can be calculated using Equation B-1 below. Equation B-1 should, therefore, be exercised twice. The first time involves data input without the energy efficiency improvement. The second time involves data input with the energy efficiency improvement. The difference between the two results is the energy savings attributable to the efficiency improvement.

B-1 $$(8.33 \times GPD \times (T_{wat} - T_{input}) \times P \times 365) / (100{,}000 \times SE)$$

WHERE:

8.33 = specific weight of water

GPD = Gallons per person per day of domestic hot water use

T_{wat} = temperature of hot water in tank

T_{input} = input water temperature

P = number of persons in dwelling unit

365 = number of days per year

100,000 = number of Btu per therm

SE = system efficiency

The energy savings from increasing the efficiency of a domestic hot water heater jacket should be calculated through a two-step process. The energy consumption of a particular domestic hot water heater can be calculated using Equation B-2 below. Equation B-2 should, therefore, be exercised twice. The first time involves data input without the energy efficiency improvement. The second time involves data input with the energy efficiency improvement. The difference between the two results is the energy savings attributable to the efficiency improvement.

B-2 $$U \times A \times (T_{wat} - T_{amb}) \times 8760$$

WHERE:

U = inverse of R value of hot water heater shell

A = area of hot water heater tank surface

T_{wat} = temperature of hot water in tank

T_{amb} = ambient air temperature at site of hot water heater

8760 = number of hours in year

AIR SEALING

The energy savings from air sealing should be calculated through a two-step process. The energy loss due to envelope leaks can be calculated using Equation C-1 below. Equation C-1 should, therefore, be exercised twice. The first time involves data input without the air sealing. The second time involves data input with the air sealing improvement. The difference between the two results is the energy savings attributable to the air sealing improvement.

C-1 $$ACH \times Volume \times 0.018 \times HDD \times 24$$

WHERE:

ACH = air changes per hour

Volume = volume of housing unit

0.018 = constant

HDD = heating degree days

24 = hours in day

A caveat should be noted with this calculation. The significance (or substantiality) of air leakage is highly dependent on the size of the housing unit. A "small" number of air changes per hour with a big housing unit can represent a substantial air leakage (and thus a substantial energy loss). Conversely, a larger ACH for a smaller unit can possibly represent a less substantial air leakage (and thus energy loss).

APPENDIX B: SAMPLE QUESTION AND ANSWER LINKED DEPOSIT PROPOSAL

Closely related to, though not identical, to a linked deposit program is a Home Energy Rating System (HERS). Through a HERS energy efficiency audit, a home buyer discovers what cost-effective energy efficiency improvements might be made at the time of the purchase of a home.

A specific federal program, the Energy Efficient Mortgage (EEM), then allows the home buyer to borrow up to $4,000 (or five percent of the value of the home) for those cost-effective energy efficiency improvements without further credit qualification and without an appraisal of the efficiency improvements.

Because the rationale for implementation of a HERS audit is so similar to the rationale for a linked deposit energy efficiency program, a HERS question and answer proposal is set forth below as the model for a similar linked deposit document.

MID-IOWA COMMUNITY ACTION (MICA) AND IOWA DEPARTMENT OF NATURAL RESOURCES

Home Energy Rating Systems (HERS) And First Time Home Buyers Assisted Through the State Mortgage Revenue Bond (MRB) Program

February 1997

Q. WHAT ARE WE PROPOSING?

A. Mid-Iowa Community Action (MICA) and the Iowa Department of Natural Resources (DNR) propose that the Iowa Finance Authority (IFA) make available a Home Energy Rating System (HERS) energy efficiency audit as part of the home purchase financing in First Time Home Buyer transactions assisted with state Mortgage Revenue Bonds (MRBs). In Iowa, this is called the "First Time Home Buyer Mortgage Loan Program."

Q. WHAT IS A HERS AUDIT?

A. A HERS audit is an energy efficiency audit jointly developed by the U.S. Department of Energy (DOE) and the U.S. Department of Housing and Urban Development (HUD) to support an Energy Efficient Mortgage (EEM).

A HERS audit can determine at the time of a home purchase those energy efficiency measures that can be financed as part of the mortgage while at the same time reducing the total shelter costs to be paid by the home buyer.

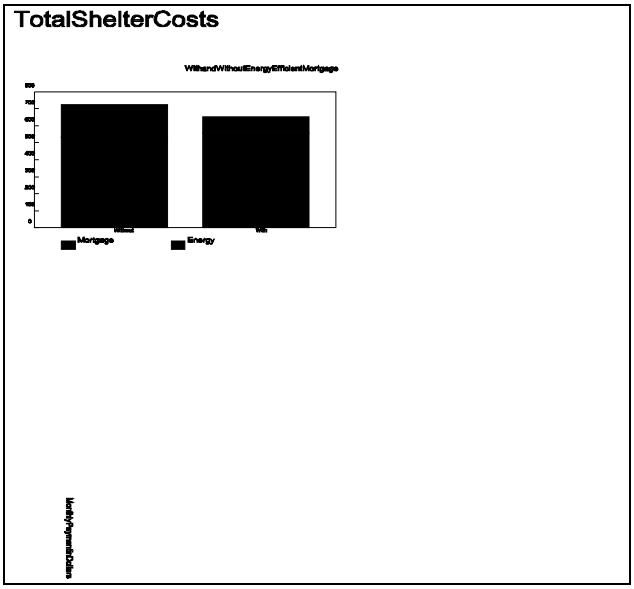
Energy efficiency can be financed as part of the mortgage while reducing total shelter costs paid by the home buyer.

Q. WHY ARE YOU APPROACHING THE IFA ABOUT OFFERING HERS AUDITS TO PARTICIPANTS IN THE FTHB MORTGAGE LOAN PROGRAM?

A. Offering EEMs to participants in the Mortgage Loan Program offers a substantial opportunity to benefit low-income households, and to increase the affordability of homeownership in the state. In 1995 alone, the IFA issued $58.1 million in bonds and closed 757 loans through the Mortgage Loan Program. Of that total,

721 loans were for the purchase of existing homes. Cumulatively, through 1995, the IFA has supported 17,007 first time home buyer loans.

Q. HOW CAN THE MORTGAGE FOR THESE PARTICIPANTS BE INCREASED WHILE TOTAL COSTS ARE DECREASED?



A. A HERS audit identifies those energy efficiency measures which will generate bill savings greater than the debt service needed to cover the loan which pays for the installation of those measures. Thus, for example, if the mortgage payment must increase by $100 a year to pay for the installation of the energy efficiency measures, the energy efficiency measures will return *more than* $100 a year in reduced energy bills. These measures are, under the terminology of the program, "cost-effective."

Q. ONCE THE ENERGY EFFICIENCY AUDIT IS PERFORMED, HOW ARE THE COST-EFFECTIVE ENERGY EFFICIENCY MEASURES FINANCED?

A. The cost-effective energy efficiency measures are financed through an "Energy Efficient Mortgage" (EEM). An EEM is a specific add-on to a home purchase mortgage which has been approved by DOE and HUD. No additional downpayment is necessary.

Q. WHAT DOES AN ENERGY EFFICIENT MORTGAGE DO?

A. An Energy Efficient Mortgage allows a home buyer to borrow up to $4,000 beyond the purchase price of the home to install cost-effective energy efficiency measures. The additional loan is insured by FHA.

The FHA program is significant because it provides that: "Under the FHA EEM Program, a borrower can finance into the mortgage 100 percent of the cost of eligible energy efficient improvements, subject to certain dollar limits, *without an appraisal of the energy improvements and without further credit qualification of the borrower*."

FHA Mortgagee Letter No. 95-46. (emphasis in original).

A borrower can finance 100 percent of the cost of eligible energy efficient improvements, *without an appraisal of the energy improvements and without further credit qualification of the borrower*."

Q. HOW WOULD THE HOME BUYER BENEFIT FROM PURSUING A HERS AUDIT AT THE TIME OF THE HOME PURCHASE?

A. The home buyer benefits in three ways.

- o First, the only energy efficiency measures that will be financed are those that reduce total costs to the home buyer. The buyer will thus save money.

- o Second, in addition to reducing utility bills, the energy efficiency audit will help increase the comfort of the home, at no net cost to the consumer.

- o Third, the consumer will be able to obtain both the bill-savings and comfort-adding measures with no additional financing costs. If the home buyer wanted to finance the same energy efficiency measures at some date after the home purchase transaction, he or she would not only have to requalify for financing, but he or she would need to pay all of the incidental costs of obtaining financing (such as financing application costs, closing costs, appraisal fees, and the like).

Q. WHAT LEVEL OF SAVINGS CAN BE EXPECTED?

A. The savings to be expected through the HERS program are significant. They can be viewed in any one of at least three ways. First, the percentage of the utility bill saved can be calculated. Second, utility savings can be translated into what it would take as a purchase price discount to obtain the same dollar savings. Third, those utility bills savings can be translated into what it would take as an interest rate discount to generate those same savings.

A February 1997 analysis of a typical homes audited through the HERS program in New Hampshire found that in order to generate the same present value energy savings, the home buyer would have needed to receive either a reduced interest rate of 1.31% (from 7.63% to 6.32%) or an 18% reduction on the home purchase price (from $77,556 to $63,237).

In order to generate the same present value energy savings, the home buyer would have needed to receive a reduced interest rate of 1.31%.

Q. HOW WOULD IFA BENEFIT FROM MAKING THE HERS AUDIT PART OF A FIRST TIME HOME BUYER PROGRAM?

A. By reducing the total costs to the consumer, the IFA will increase the safety of the loan which is made to the first time home buyer. And, since the home buyers which MICA seeks to target are those which are sufficiently low-income to qualify for MRB assistance, these reduced costs may be significant. Through

HERS, IFA will not only help *get* people into their homes, but will help people *stay* in their homes by helping to control ongoing operating costs. And IFA will help increase the comfort of the homes as well.

Q. HOW WOULD THE BANKS WHICH PARTICIPATE IN MRB FINANCING BENEFIT?

A. The banks would increase their lending by an average of 8% on each first time home buyer transaction undertaken through the MRB program. According to data released by the IFA, the average home mortgage for a home buyer assisted through MRB in Iowa was roughly $50,000 in 1994. Assuming $4,000 in energy efficiency financing, total bank lending would increase by 8.0%.

Q. DOES ONE NEED TO BE SPECIALLY QUALIFIED TO PERFORM THE HERS ENERGY EFFICIENCY AUDIT?

A. Yes. MICA has received HERS certifications for its energy auditors. In addition, because MICA is a contractor with the state to do low-income weatherization through the federal Weatherization Assistance Program (WAP), it has the ability to install and inspect the energy efficiency measures as well. Attached to this Q&A sheet is a description of MICA.

Q. HOW IS MICA PAID TO PERFORM THE HERS AUDIT?

A. MICA would contractually agree with IFA to perform each HERS audit for an established fee. The financing process approved by DOE and HUD then allows this audit fee to be financed as part of the EEM. The HERS audit fee would be set according to guidelines provided by DOE and HUD.

Q. WHAT SPECIFICALLY DOES MICA PROPOSE THAT IFA DO AT THIS POINT?

A. MICA requests that IFA approve a demonstration project involving from 50 to 100 first time home buyer participants in the MICA service territory over the next twelve months. This demonstration project will allow MICA, the participating banks, and IFA to work out the exact procedures for performing the audit, obtaining the financing, installing and inspecting the energy efficiency measures, and paying the installation contractors.

If the demonstration project is successful, MICA proposes that IFA expand the HERS audit requirement to all other MRB-assisted first time home buyers statewide as quickly as the capacity to deliver the audits, install the measures, and inspect the installations, can be demonstrated.

Q. WHAT IS DIFFERENT ABOUT THE HERS AUDIT AND FIRST TIME HOME BUYER PROGRAMS? WHY ARE YOU ASKING PERMISSION FOR

A DEMONSTRATION PROJECT?

A. HERS audits and EEMS are an established vehicle for financing energy efficiency for home buyers today. In most instances, however, HERS audits are directed toward home buyers of moderate means (or more). The HERS audit is marketed on a customer-by-customer basis through banks, realtors, and the like. What is different in this program is that MICA proposes that IFA institutionalize the HERS audit for an *entire group* of home buyers (those home buyers receiving MRB assistance). The reason to institutionalize the HERS audit for this group of households is three-fold.

(1) Because of their limited means, low- and moderate-income first time home buyers assisted through MRB will receive unique financial benefits by reducing total costs through a HERS/EEM transaction.

Low- and moderate-income first time home buyers receive unique financial benefits by reducing total costs through a HERS/EEM transaction.

(2) Because of the limited means of MRB home buyers, unless the HERS/EEM transaction can be incorporated into the initial home buying process, it will be impossible for these households to later obtain either the audit or the energy efficiency financing at some later date; and

(3) One additional "amenity" that the state can offer to low- and moderate-income home buyers assisted through MRB is the increased comfort (at no net cost) that arises through the installation of energy efficiency measures. Again, however, unless those measures are made a part of the initial home purchase transaction, the ability to obtain that additional comfort will likely be lost.

APPENDIX C: SAMPLE LINKED DEPOSIT PROPOSAL (INTERNAL)

Whiteacre Community Development Corporation proposes that Ourtown, Homestate, initiate and participate in a pilot "linked deposit" project involving two tracks:

- o The delivery of energy efficiency audits to housing rehabbed through WCDC efforts, with the energy efficiency measures found to be cost-effective financed through a linked-deposit program; and

- o The delivery of energy efficiency audits to First Time Home Buyers assisted through either the Homestate Mortgage Revenue Bond (MRB) program or through federal HOME dollars, with the energy efficiency measures found to be cost-effective financed through an Energy Efficiency Mortgage (EEM) from a participating bank.

TRACK 1: LINKED DEPOSITS AND REHABBED UNITS

Purposes

The purposes of a linked deposit program for housing units rehabbed through WCDC are two-fold:

1. To generate energy efficiency savings, and thus bill savings, to low-income residents of the housing, thus improving long-term shelter affordability for those households; and

2. To develop a new stream of revenue for WCDC to help replace lost dollars from (a) reduced DOE/WAP funds, and (b) reduced utility demand side management

(DSM) programs.

Process

The Immediate Project: The pilot project would identify housing that is being rehabbed under the direction of WCDC. The program should begin by targeting the units which WCDC develops using the HOME Single Family Residential Rehabilitation funds received from the Homestate Housing Finance Agency. According to WCDC's 1995 annual report, the 1995 pilot HOME program involved funds sufficient to rehabilitate 10 single family homes.

Such an incremental effort would allow the creation of a mechanism for using linked deposits without putting too great a strain on the existing energy efficiency load of the WAP staff. According to the 1995 WCDC annual report, WCDC weatherized roughly 220 homes in 1995. To add an additional 10 homes through this linked deposit program would appear to be manageable. Moreover, keeping it all "in-house" would facilitate efficiency in the efforts to develop a working relationship between the energy efficiency crews and the housing rehabilitation crews.

The Mid-Term Project: The mid-term goal is more substantial. According to HUD's June 29, 1996 Cash Management Information (CMI) report for HOME dollars in Homestate, since 1992, Homestate (all jurisdictions) has completed rehabilitation on 353 units (including 191 renter-occupied and 162 owner-occupied properties). To develop a system for ensuring that energy efficiency services are delivered to those units would be a significant addition to the production of energy efficient low-income homes in Homestate.

The *initial* effort, however, should be moderate, with energy efficiency audits provided to the 10 single family homes rehabbed using HOME dollars each year. Once we create the infrastructure is created for: (1) delivering the audits; (2) obtaining the financing; and (3) installing those measures found to be cost-effective, the effort should be expanded to remaining units rehabbed using HOME funds.

The Longer-Term Project: In the longer term, the intent would be for WCDC to deliver energy efficiency audits as the last step in *any* rehabilitation efforts funded through the agency's extensive housing rehab efforts, with financing provided through the linked deposit mechanism. This might involve energy efficiency audits directed toward multi-family units. To the extent that the Section 8 housing developed by WCDC involves housing with heat and utilities included in rents, increased energy efficiency (and decreased utility bills) would presumably reduce rents and make housing more affordable to tenants. The energy efficiency audits should be tied into homes rehabilitated through the Homestate state housing trust fund as well (the Homestate Affordable Housing Fund). The belief is that the last step in any rehabilitation work performed using public funds should be an energy efficiency audit. The linked deposit would be the means of financing measures found to be cost-effective.

Tasks

The tasks involved with establishing a linked deposit program would be nine-fold:

1. Document energy and bills savings from existing WCDC weatherization efforts;

2. Outline in detail the process of a weatherization audit and determine how and when that weatherization audit might fit into the rehabilitation process;

3. Calculate the cost of doing an energy efficiency audit for HOME units; separately calculate cost of installing various energy efficiency improvements;

4. Do financial pro formas outlining how the energy efficiency measures might affect project/household cash flow for first five years;

5. Agree internally (within WCDC) on the broad outlines of the desired linked deposit program;

6. Approach the bank (or financial institution) with whom WCDC currently has a working relationship about the potential for implementing a linked deposit program;

7. Approach a potential depositor (utility? city?) with a specific linked deposit proposal involving a specific sum of funds to be deposited with a specific financial institution;

8. Convene meeting of depositor and bank to negotiate terms and process of the linked deposit; and

9. Convene meeting between WCDC, state HFA (as HOME administrator), and financial institution to negotiate terms and process of obtaining the energy efficiency financing.

10. Convene a meeting between the local financial institution and WCDC to negotiate the financial arrangement between WCDC and the relevant party for compensation to be paid for the energy efficiency audit and the installation of cost-effective measures.

WCDC Resources That will be Required

The resources that WCDC would be required to devote to such a project would not be

substantial. The primary effort is in the preparation of the initial proposal to a potential depositor; the presentation of that proposal; and the negotiation of the linked deposit arrangement. The tasks necessary for this process would include:

1. Developing the proposed linked deposit agreement between the depositor, the lender and WCDC;

2. Developing the financial statements showing the financial impact to the developer (or the individual home buyer), including the net present value impacts and the cash flow impacts;

3. Developing a proposed linked deposit amount and the budget for those funds, on both an individual unit and an aggregate basis; and

4. Calculating the cost to the depositor from accepting reduced interest rates, including cost offsets if any.

Aside from the specific linked deposit arrangements, internal stafftime would also be necessary to contract with an energy efficiency auditor, a home performance contractor to install the efficiency measures, and an inspector to provide post-installation inspections. Negotiating a contractual arrangement with the local low-income weatherization provider would seem a reasonable course of action in this regard and would minimize the time commitment required.

APPENDIX D SAMPLE LINKED DEPOSIT AGREEMENT

This program is in support of energy efficiency for low-income customers of ABC Energy Company (USA Energy). The program is designed to provide ongoing support to energy efficiency through a revolving loan fund capitalized by an initial $1.0 million deposit by USA Energy with the Ourstate National Bank. The program is intended to be a partnership which will generate benefits that extend beyond the simple expenditure of $1.0 million on the direct installation of low-income energy efficiency measures.

DEMONSTRATION PROJECT:

The project outlined below is intended to be a demonstration project initially limited to the service territory of USA Energy. The demonstration project is initially limited to housing developments under the direction and administration of community action agencies.

Upon a successful demonstration of the administrative feasibility of this project, the intent is to expand the project lending to areas outside the USA Energy service territory. Expansion of the project lending outside the USA Energy service territory will be accomplished with additional deposits provided by entities other than USA Energy. Deposits may be made with Ourstate National Bank or some other financial institution.

THE PARTNERS:

1. ABC Energy Company, with its principal offices in Ourtown, Homestate, is a combined natural gas and electricity company serving much of the Commonwealth of Homestate. USA Energy serves natural gas and electric customers in communities which include, but are not limited to, (1) Ourtown; (2) Whiteacre; (3) Greenacre; (4) Blackacre; (5) Redacre; and (6) Hometown.

2. The Ourstate National Bank Corporation (Ourstate National or Ourstate National Bank),

with its principal offices in Whiteacre, Homestate, is a bank which serves much of the Commonwealth of Homestate. Ourstate National's business includes making loans to residential customers and to developers of affordable housing throughout Homestate.

3. Homestate community action agencies are not-for-profit agencies which are the subgrantees for, among other things, the federal Weatherization Assistance Program (WAP) in Homestate. In that capacity, CAAs perform energy efficiency audits and install energy efficiency measures in low-income single and multi-family dwelling units. In addition, many Homestate CAAs operate as developers of affordable housing in their respective service territories. This affordable housing work includes work financed in whole or part by federal Community Development Block Grant (CDBG) and federal Home Investment Partnership (HOME) funds. The affordable housing work of the Homestate CAAs includes to varying degrees both new home construction and existing housing rehabilitation.

PROJECT SUMMARY:

This project uses an initial deposit by ABC Energy Company with Ourstate National Bank to capitalize a revolving loan fund to finance energy efficiency in the homes of income-eligible households. The loan fund is replenished through a shared savings mechanism through which a proportion of the bill savings generated by the energy efficiency measures installed are used to retire the loans made to finance the measures. USA Energy will accept a below-market rate interest rate on its deposit with the difference between that interest rate and the market rate which otherwise would be available representing that company's contribution to the energy efficiency program.

PROJECT DESCRIPTION:

Capitalization of the Loan Fund

USA Energy will purchase a seven year $1.0 million certificate of deposit (CD) (or other appropriate financial instrument agreed to by the project partners) from Ourstate National Bank. These funds deposited with Ourstate National by USA Energy will be dedicated exclusively to the energy efficiency lending outlined in the Project Description below.

Repayment of the funds loaned through the mechanism outlined in the Project Description below will represent additions to the initial capitalization of the revolving loan fund.

Interest Rate Provided to USA Energy

Ourstate National will provide USA Energy an interest rate of 3.5% per annum calculated in the same fashion as the interest rate on like financial instruments by any other depositor. At the end

of seven years, the certificate of deposit will be subject to roll-over at an interest rate to be determined at that time. The presumption will be that absent significant changes in the interest rates otherwise available in 1996 - 1997, the interest rate will remain at or near 3.5% for USA Energy's CD.

Interest Rate to Be Charged for Loaned Funds

Ourstate National may charge borrowers an interest rate equal to 3.5% plus an administrative fee not to exceed xx basis points on loaned funds.

Availability of Loan Funds for Low-Income Energy Efficiency

Under the demonstration program, a borrower may finance 100 percent of the cost of eligible energy efficient improvements, subject to certain dollar limits, without an appraisal of the energy improvements and without further credit qualification of the borrower.

Eligible Energy Efficiency Improvements

An energy efficiency improvement eligible for financing through the demonstration program must meet all of the following criteria:

1. Be installed in a low-income housing unit. A "low-income" housing unit is defined consistent with the federal Weatherization Assistance Program (WAP) definition; however, any units receiving low-income housing funds through a federal or state program will be conclusively presumed to be a "low-income housing unit" irrespective of WAP guidelines.

2. Be determined to be cost-effective. "Cost-effective" is defined to mean that the total cost of the package of energy efficiency improvements is less than the total present value of the energy saved over the useful life of the energy improvements.

3. Be installed pursuant to an energy efficiency audit consistent with the energy efficiency audits performed using guidelines promulgated by WAP, HERS (Home Energy Rating System) or a utility-approved demand side management (DSM) program. Measures might include heating, non-heating and water efficiency improvements.

4. Be installed as part of a new housing construction or substantial rehabilitation effort.

5. Be not more than the greater of 5% of the property's value or $4,000 per unit.

6. Be the incremental investment in energy efficiency not otherwise installed because of Code requirements, common standards of the low-income housing construction trade serving the area or existing weatherization programs.

Eligible Borrowers

1. Energy efficiency lending through this demonstration program will be available to all community action agencies who are serving as not-for-profit developers of affordable housing in the service territory of ABC Energy Company.

2. Borrowers can access the loan fund in support of work for either single family or multi-family units.

3. Borrowers can access the fund in support of work for either owner-occupied or renter-occupied units.

4. Lending performed through this demonstration program will be coordinated with the state implementation of the federally-funded Weatherization Assistance Program (WAP) and other similar efforts to the maximum extent practicable.

5. Borrowers who access the loan fund for rental housing must sign certificates used in the WAP program, certifying that they will not raise rents to tenants of assisted units as a result of the energy efficiency improvements for 12 months.

Targeting of Energy Efficiency Lending

1. Energy efficiency lending in this demonstration program will be targeted to units not involving first time home buyer programs. Energy efficiency improvements in new construction or substantial rehabilitation units undertaken as part of, or in conjunction with, a first time home buyer program will be presumed eligible for a HERS audit and an Energy Efficiency Mortgage (EEM).

2. Loans made through the demonstration program will be targeted to housing units that would otherwise not be treated with energy efficiency measures in the absence of the program. The intent of the program is to avoid making households who would have received free weatherization services through WAP pay for those services through the linked deposit program.

Loan Servicing

Loans made for energy efficiency improvements through this demonstration program will be repaid as part of the customer's utility bill. USA Energy will be responsible for transferring

customer payments to Ourstate National Bank at intervals mutually agreed to by the participants in this demonstration project. Customers will involve the residents of individual units in those instances were units are individually metered or project managers in those instances were units are master-metered.

1. Monthly loan repayment amounts will equal 70% of the weather normalized bill savings estimated to result from the installation of the energy efficiency measures at the time of installation.

2. Monthly customer bill payments to USA Energy will be credited in pre-determined order of priority. Any bill payments should: (1) first be applied to past-due bills for current usage; (2) second be applied to current bills for current usage; (3) third be applied to loan payments in arrears; and (4) finally be applied to current loan payments.

3. Customers may not be subject to the disconnection of service for failure to make a loan payment. Nor may a customer be threatened with the potential disconnection of service for a failure to make a loan payment. Other collection mechanisms available under law may be used to collect the outstanding payments.

If ownership of a housing unit for which an energy efficiency loan has been made is transferred prior to the completion of the loan repayment period, the outstanding principal and interest owing on the energy efficiency loan will be repaid to the loan pool from the proceeds of the sale. This requirement does not apply to situations involving housing developers transferring ownership of properties constructed or rehabbed for purposes of home ownership.

Loan Capital as Guarantee Pool

The initial $1.0 million in capitalization will be used in part as a guarantee fund for the demonstration project. The guarantee fund is to protect against one specific risk:

1. If the repayment of a loan is determined to have become uncollectible, 50 percent of the principle and interest determined to be uncollectible will be paid from the undistributed portion of the loan pool.

No risk other than that enumerated in this paragraph is subject to guarantee by the loan pool.

PROJECT OPERATIONS:

Loan Application

Access to the energy efficiency loan funds will be initiated by a credit application to Ourstate

National Banks by a CAA serving as a not-for-profit housing developer in the USA Energy service territory. An application for funding from the energy efficiency loan fund will be accompanied by the written results of an energy efficiency audit and a request for a specific sum of money.

Loan Escrow

Upon approval of the credit application, Ourstate National will escrow the requested sum of money for a period not to exceed 90 days during which time the energy efficiency improvements found by the energy efficiency audit to be cost-effective must be installed.

Installation Contractor

For purposes of this pilot project, installation of the energy efficiency measures will be performed by the CAA which applies for the loan. The "installation" of energy efficiency measures will include inspection of the installations consistent with the standards used in the inspection of the installation of WAP measures.

Contractor Payment

Upon certification of the inspector that the energy efficiency measures have been adequately and appropriately installed, a bill for the installation and inspection services will be rendered which is not to exceed the escrowed amounts. Payment from the escrow account will be made upon receipt of this certification. Payment will be made in a two-party check made payable jointly to the borrower and the energy efficiency contractor.

APPENDIX E: REFERENCES: ENERGY EFFICIENCY IN AFFORDABLE HOUSING

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