

Yes, You Can Please 'Em All

by Paul Knight

Government funds for low-income weatherization often end up as savings in the pockets of landlords, with no savings passed on to the tenants. A pilot program in Chicago showed that tenants and landlords can share the financial benefits of weatherization.

An innovative low-income weatherization project in Chicago has demonstrated that both multifamily building owners and low-income tenants can share the financial benefits of weatherization.

Building owners participating in the Shared Benefits Program contributed 20% of the weatherization costs, and the Illinois Department of Energy and Natural Resources provided the remaining 80% as a weatherization grant. In return for the grant, the landlords will freeze the rents of the low-income tenants until September 1989.

Three multifamily buildings were weatherized under the pilot program during the summer of 1987. Energy savings that following winter amounted to \$19,000 and \$11,000 in two of the three buildings. The third building is oil-heated, and due to inadequate billing information, actual savings could not be determined.

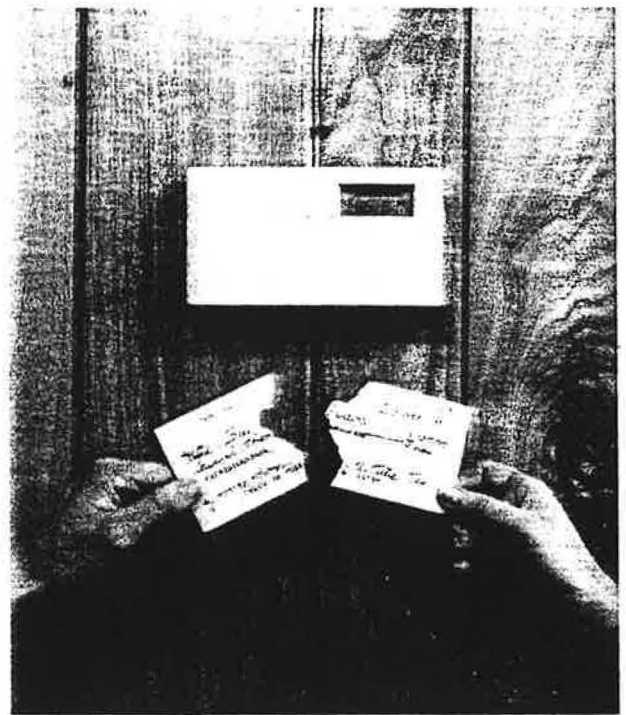
The Problem

A significant portion of Chicago's low-income population lives in older multifamily buildings that are centrally heated and master-metered. Tenants pay heating bills indirectly through their rents.

When these buildings are weatherized, usually both the owners and tenants benefit. Owners receive lower fuel bills. Tenants are more comfortable, either because the temperature is higher or reduced infiltration makes the home feel warmer. This division of the benefits is not

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necessarily inappropriate. If owners pay for weatherization work, via loans for example, they assume the risk of repaying the loans. Owners *should* enjoy the benefits of the energy savings (and have less incentive to weatherize without that prospect).



Chris Galwell

Both tenant and owner benefit from weatherization under Chicago's new Shared Benefits Program.

A problem arises, however, when public funds finance weatherization, such as Low-Income Weatherization Assistance Program (LIWAP) grants. In this situation, energy savings accrue to the owner simply because low-income tenants live in the building. There is no mechanism for sharing those savings with the tenants. Many have asked: Is this situation fair?

Significant energy savings can be had by weatherizing older multifamily buildings. The Energy Resources Center at the University of Illinois at Chicago and Energy and Natural Resources developed the Shared Benefits Program based on the belief that these large energy savings would offset a 20% owner contribution and the amount of rent loss the owner might expect from a rent freeze. Thus, weatherization dollars could be stretched further,

owners could make a commitment to weatherization, and tenants could share the financial benefits via the rent freeze. The objective of the Shared Benefits Program was to demonstrate this premise.

Shared Benefits Program Features

Listed below are the major features of the Shared Benefits Program.

- Energy and Natural Resources contributed, as a grant, 80% of the weatherization cost (to a maximum of \$1,280 per low-income household).
- The building owner contributed 20% of the weatherization costs.
- The total grant for a multifamily building was dependent upon the number of low-income households in the building.
- The building owner had to freeze rents of low-income tenants for a minimum of two years.
- At least 66% of the building units had to be occupied by low-income tenants.
- Cost-effective retrofits were determined by a computerized audit.
- Retrofits were not limited to units occupied by low-income households—the most cost-effective retrofits (based on Benefit-to-Cost Ratio) were installed up to the budget limit for the building (number of low-income households x \$1,280 = building budget limit).

Pilot Takes Off

Funded by Energy and Natural Resources, the demonstration project was implemented by the Energy Resources Center and PRIDE Community Energy Center, a neighborhood development group (see boxes). The key person from the state was R. Forrest Lupu for the pilot project. Henry Kurth is handling the current program.

The state provided approximately \$60,000 for weatherization. At \$1,280 per unit, this permitted us to weatherize three multifamily buildings containing 68 apartments.

Profile: Energy Resources Center

The Energy Resources Center is an interdisciplinary research and public service organization at the University of Illinois at Chicago. The Center was established in September 1973 by the University's Board of Trustees to conduct studies in the field of energy and to provide local, state, and federal governments and the public with current information and advice on energy technology and policy.

For the past 15 years the Energy Resources Center has worked with local, state, and federal government agencies, legislative commissions, energy industries, public utilities, and public-interest groups on a broad range of studies, research projects, and educational programs.

The Center's professional research staff is drawn from a variety of university disciplines, including architecture, engineering, computer science, economics, and political science. When other specialized skills are required, the Center draws upon other University of Illinois at Chicago faculty for support.

Profile: People's Reinvestment and Development Effort (PRIDE)

People's Reinvestment and Development Effort (PRIDE) is a non-for-profit neighborhood housing development corporation. Established in June of 1981, the mission of PRIDE has been to provide decent, affordable housing to low- and moderate-income residents of the South Austin neighborhood of Chicago. PRIDE has sought to fulfill its mission to the community through several kinds of efforts. These include:

- Energy and Loan Programs—PRIDE administers three programs to help owners finance energy conservation and general rehab work.
- Rehabilitation and Development—PRIDE has acted as owner and developer for over 180 units in seriously dilapidated apartment buildings.
- Property Management—Over 165 units of low-income and "market rent" apartments are managed by PRIDE.

As an active member of the Chicago Rehab Network, PRIDE works together with other low- and moderate-income housing developers from around Chicago to save and upgrade housing. Community residents who make up the board of directors control PRIDE's developments and programs. Paul Roberts is PRIDE's key person for the Shared Benefits Program.

(Only 50 households were income-eligible for the LIWAP funds, but we weatherized the whole buildings.)

PRIDE maintains a fairly complete record of multifamily building owners on the far west side of Chicago. A number of these owners were invited by PRIDE to attend a workshop in April 1987 to discuss the program. Of the 15 building owners who attended, 10 completed applications to participate. Owners agreed to freeze tenant rents at the time they submitted their applications.

PRIDE staff verified that at least 66% of the tenants living in each building were low-income according to the eligibility requirements of the Illinois Residential Affordable Payment Program. Then they completed a computerized building audit for each of the ten buildings to estimate retrofit energy savings.

The Center for Neighborhood Technology in Chicago developed the audit software. It is used by community energy centers, such as PRIDE, in delivering a weatherization loan program funded by the City of Chicago and the People's Gas Company. The audit provides a utility bill analysis, energy conservation measure analysis, savings and cost projections, and energy management recommendations. It uses standard ASHRAE engineering calculations to estimate savings.

The auditors analyzed a number of measures for each building. This included all kinds of measures, from weatherstripping to boiler replacement. PRIDE had extensive experience in implementing the Chicago loan program. Consequently, PRIDE was able to estimate, rather accurately, costs for the various measures.

We used the results of the energy audit to compare the estimated energy savings to the owner's investment (20% contribution and rent loss due to freeze). We discussed the results of the audit and cash-flow analysis with the building owners on an individual basis. Following these

MULTI-FAMILY

discussions, we met with Energy and Natural Resources and PRIDE staff to select the buildings for the program. On the basis of the savings estimates, the owner's ability to pay, and some study design criteria, we chose three buildings. The design criteria included need for one oil-heated building and a variety of building sizes. Another factor we considered was how close the buildings were to failing economically, where savings would make a serious difference. One of the buildings, in fact, was in receivership.

Then we sent letters to the building tenants, explaining the program and, more importantly, the rent freeze.

PRIDE proceeded to develop specifications for the retrofits, take bids, choose contractors, and issue notices to proceed. By July, work was underway, and by October, all work complete.

The Energy Resources Center completed an evaluation of the program in the summer of 1988. It measured the actual energy savings, solicited owner and tenant comments, and recommended program modifications.

Program Evaluation

The PRInceton Scorekeeping Method (PRISM) computer program proved useful to determine normalized annual consumption for each building. Discussions with building owners and tenants focused on increased comfort, problems with the retrofits, and adherence to the rent freeze. We made site visits to inspect the retrofits and discuss the program with the participants.

Here is a brief description of the three buildings, the retrofits installed, and estimated and actual savings.

Building One is a three-storey, 23-unit building heated with natural gas. Eighteen of the households qualified as low-income. Total gas bills for the 1986-87 heating season were \$41,268. The energy consumption index was 1.9 therms per square foot per year. The annual gas cost was \$1,794 per unit, requiring approximately six months rent to pay! From an energy perspective, this was the worst building of the ten applicants.



Dave Jones

Before the retrofit, Building One's annual gas cost was \$1,794 per unit, requiring approximately six months rent to pay.

A summary of retrofits installed in this building and their costs is shown in Table 1.

Table 1. Cost of Retrofitting Building One

Energy Conservation Measure	Total Cost	ENR Cost	Owner Cost
Boiler Replacement	\$15,100	\$12,080	\$3,020
Outdoor Reset Control	1,850	1,480	370
Line and Radiator Vents	550	440	110
Water Heater Vent Damper	150	120	30
Ceiling Insulation	4,950	3,960	990
Bypass Sealing	2,662	2,130	532
Light Fixture Replacement	2,350	1,880	470
Total	27,612	22,090	5,522

Buildings One and Two needed boiler replacement because of the existing boilers' serious state of disrepair. While the new boilers weren't condensing, they were fairly efficient: 78% at steady state.

Incandescent lights in common areas were replaced with fluorescent fixtures.

Annual savings amounted to \$18,884.

Estimated and actual cash flow to the building owner over the two-year rent freeze period is shown in Table 2. Actual energy savings—for gas and electricity—were determined by taking first year savings and multiplying by two. Actual energy savings were 17% greater than estimated. Actual cash flow was 26% better than anticipated. The greater actual savings are the pleasant windfall of a fairly conservative audit.

Table 2. Estimated vs. Actual Cash Flow over Two Years for Building One

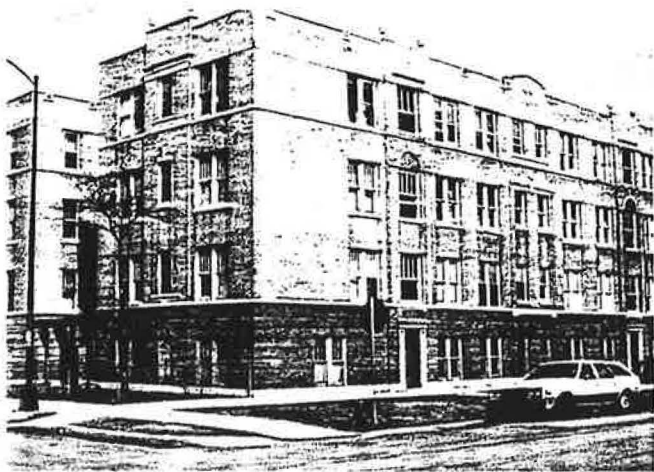
	Two-year Energy Savings (a)	20% Owner Contribution (b)	Two-year Tenant Rent Savings (c)	Net Cash Flow (d=a-(b+c))
Estimated	\$ 32,392	5,520	6,480	20,392
Actual	37,768	5,520	6,480	25,768

In other words, because the owner decided to participate in the program, he'll be more than \$25,000 ahead after two years because of investing \$12,000 in the building (20% contribution and rent freeze). At the same time, the value of this property has probably increased.

Table 3. Retrofit Costs for Building Two

Measure	Total Cost	ENR Cost	Owner Cost
Boiler Replacement	\$18,775	\$15,020	\$3,755
Setback Thermostat	1,675	1,340	335
Tank-type Water Heater	4,350	3,480	870
Ceiling Insulation (R-30)	4,875	3,900	975
Light Fixture Replacement	4,575	3,660	915
Total	34,250	27,400	6,850

The tank-type water heater replaced the tankless coil that had been embedded in the old boiler.



Dave Jones

Building Two in the Shared Benefits pilot program received a new, efficient boiler, a setback thermostat, R-30 ceiling insulation, and lighting retrofits. Total savings amounted to \$10,660.

Building Two is a three-storey, 33-unit building heated with natural gas. Twenty-two of the households qualified as low-income. Gas bills for the 1986-87 heating season amounted to \$31,028. The energy consumption index was 1.7 therms per square foot per year. The "heating" cost per unit was \$940. A summary of retrofits is shown in Table 3. Total savings amounted to \$10,660.

Estimated and actual cash flow to the building owner over the two-year rent freeze period is shown in Table 4.

Table 4. Estimated vs. Actual Cash Flow for Building Two

	Two-year Energy Savings (a)	20% Owner Contri- bution(b)	Two-year Tenant Rent Savings(c)	Net Cash Flow d=a-(b+c)
Estimated	\$ 18,016	6,850	10,560	606
Actual	21,320	6,850	10,560	3,910



Dave Jones

Through a combination of Low-Income Weatherization funds and owner contributions, Building Three could afford more than \$10,000 worth of storm windows, and still give low-income renters a two-year rent freeze.

Table 5. Cost of Retrofitting Building Three

Measure	Total Cost	ENR Cost	Owner Cost
Clean Burner, Tune Up	\$640	\$512	\$128
Line and Radiator Vents	375	300	75
Storm Windows	10,672	8,538	2,134
Ceiling Insulation (R-30)	2,760	2,208	552
Total	14,447	11,558	2,889

Actual energy savings were determined by taking first year savings and multiplying by two. Actual energy savings were more than 18% greater than estimated resulting in the significantly higher cash flow.

The third building is a three-storey, 12-unit building and is heated with oil. Ten units qualified for the program. Gas bills for the 1986-87 heating season were \$14,135. The energy consumption index was 1.4×10^5 Btu/ft² per year. "Heating" cost per unit was \$1,178.

A summary of retrofits installed in this building and their costs is shown in Table 5.

Due to inadequate billing, we could not determine actual energy savings for this building.

Estimated cash flow to the building owner over the two-year rent freeze period is shown in Table 6.

Table 6. Estimated Cash Flow for Building Three

	Two-year Energy Savings (a)	20% Owner Contri- bution(b)	Two-year Tenant Rent Savings(c)	Net Cash Flow d=a-(b+c)
Estimated	\$ 7,326	2,889	3,600	837

Owner and Tenant Comments

This past summer, we gathered comments from both the owners and tenants.

As it turned out, two of the three buildings changed owners over the winter (Buildings One and Two). The new owners were pleased with the previous winter's utility bills and one inquired about technical assistance to do further weatherization work. The owner of the oil-heated building was also pleased, but we were unable to provide him with actual energy savings figures.

All the owners were abiding by the rent freeze. More recently, though, one owner attempted to raise rents. We were tipped off by the tenants, and after we discussed the matter with the owner, he relented and the rent freeze remained intact.

The tenants were also pleased. "The rent freeze was fine and dandy and comfort had improved, but..." But the windows were still drafty, the plumbing still leaked, walls needed painting, mailboxes needed repair, etc.

This was an important lesson to us. Although the energy efficiency of the buildings had improved, tenants felt other building problems were more important than saving energy. Is it possible to modify tenant benefits to include both a rent freeze and other building improvements? We think so.