

# **Combining Community-Based Efforts and Geographic Targeting to Optimize Delivery of Energy Efficiency Programs**

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## **ABSTRACT**

The Community Energy Cooperative (Cooperative) was formed in June 2000 by the Center for Neighborhood Technology (CNT) in partnership with Commonwealth Edison (ComEd). The Cooperative exists to reduce peak electrical demand by helping communities implement technologies to improve energy efficiency. The Cooperative is unique in that its approach combines the use of community-based efforts and geographic targeting to reduce peak demand in areas that need electricity infrastructure improvements.

The Cooperative began full-scale implementation of its residential energy programs in four Chicago-area communities during 2001. Despite the Cooperative's brief history, membership and participation have grown rapidly, creating measurable reductions in peak demand. The Cooperative has recruited over 5,800 residential members and replaced about 7,200 old, inefficient window air conditioners and 700 central air conditioners with new, efficient models.

Previous papers have described the Cooperative and its initial experiences (Budd 2000 and Kushler 2001) prior to the full-scale implementation of its residential programs. The significance of this paper is that it presents results describing how the Cooperative is successfully using community-based efforts to optimize the delivery of its residential energy efficiency programs.

## **About the Cooperative**

Two factors played a major role in the creation of the Cooperative. First, ComEd experienced difficulties serving its customers during the summer of 1999 due to problems with its transmission and delivery infrastructure. Second, the passage of the *Illinois Electric Service Customer Choice and Rate Relief Law of 1997* opens up the electricity market to competition in 2005, creating new opportunities for electric utility companies like ComEd and its customers to work together. CNT, a Chicago non-profit community development organization, recognized this as an opportunity to form a mutually beneficial relationship with ComEd. In January 2000, CNT and ComEd created a three-year pilot program, the Cooperative.

The mission of the Cooperative is to promote community development by: (1) improving neighborhood electrical reliability, (2) reducing the costs of energy services, and (3) permitting community participation in the new markets created by industry restructuring. The Cooperative accomplishes this through: (1) development of community-based energy efficiency, load management and generation strategies, (2) cooperation with existing community organizations, and (3) aggregation of community purchasing power.

The Cooperative is unique in that its approach combines the use of community-based efforts and geographic targeting to reduce peak demand in areas that need electricity infrastructure improvements. Its activities to date are based in targeted community areas selected by a team from ComEd and CNT. The Cooperative has used varying levels of community-based efforts across each of these targeted communities. This allowed the Cooperative to test ways in which its programs can be delivered in different communities.

The benefits of the Cooperative accrue both to participating communities and to ComEd. Through aggregation, consumers can become more active in determining their own energy future. If many participants in the same neighborhood reduce their peak demand for electricity, they can increase the reliability of service and become a more attractive market for electricity suppliers. A decrease in peak demand benefits ComEd by avoiding the high cost of supplying electricity at peak times and the costs of new investment in transmission and delivery infrastructure, which are especially high when that equipment is being used to capacity.

## **Services Offered by the Cooperative**

In exchange for a membership fee of \$5, the Cooperative offered its residential members services to improve energy efficiency. These are described below.

### **Window Air Conditioner (AC) Exchange Program**

The Cooperative offered new, Energy Star Amana Quiet Zone ACs to its members at greatly reduced prices. Three models (5,100, 6,600, and 8,700 BTU) were offered at prices of \$55, \$82, and \$109, respectively. The Cooperative charged \$27 per unit for home delivery and \$27 per unit for installation. Participants were required to exchange an older, fully operational AC for the new AC.

### **Central Air Conditioner (CAC) Exchange Program**

The Cooperative offered its members rebates of \$300/kW saved from replacing an old CAC with a new, more efficient model. The base efficiency from which the kW savings were calculated was 10 SEER. Members were required to purchase the CAC from a Cooperative-approved contractor. The Cooperative paid these contractors \$100 per unit to perform the load calculations to estimate the kW savings.

### **Energy Kits**

Energy kits were given free to members when they joined. This was made possible by a partnership with the State of Illinois. The kits included three compact fluorescent light bulbs, a water-saving showerhead, water-saving faucet aerators, window insulation film, insulation for electrical outlets and light switches, and information on how to conserve energy in the home.

## **Community Benefits Fund**

A Community Benefits Fund was established as a way for the energy efficiency and conservation strategies of Cooperative members to create benefits for the entire community. For every kW saved by its members, the Cooperative contributes to the fund. Grants between \$5,000 and \$25,000 are being awarded for selected projects in the Cooperative's targeted community areas. The projects range from energy efficiency investments and education about conservation to job training and health care.

## **Selection of Target Communities**

The Cooperative and ComEd formed a committee to select target communities. The selection process was designed to facilitate the Cooperative's use of community-based efforts and geographic targeting to reduce peak demand in areas that need electricity infrastructure improvements. Communities were selected using a two-step process. The first step identified areas of Chicago and its surrounding suburbs that were served by substations nearing capacity, as well as areas that had consistently experienced reliability problems. The reason was that peak demand reductions in these areas would be more effective than in areas that had plenty of infrastructure capacity. The second step identified areas in this subset that had the presence of strong social capital. The reason was that the Cooperative's community-based efforts in these areas would be more effective than in areas lacking social capital. The committee chose Pilsen, Elgin, Park Forest, and Northwest Chicago. Each of these communities is described below.

### **Pilsen**

Pilsen is a predominantly Latino community located 15 minutes by public transportation from downtown Chicago. Pilsen has been considered a major port-of-entry for immigrants from Mexico and has long been known as the cultural center of the Mexican-American community in Chicago. Spanish is the first language of most Pilsen residents and the only language of many. Pilsen was chosen for several reasons. Reliability data indicated that Pilsen had experienced consistent power interruptions. In addition, forecasted demand growth for Pilsen was low—allowing peak demand reductions to defer capital investment in existing infrastructure for multiple years. Pilsen also has a long history of community organizing and strong social networks, including local commerce, industry, businesses, residences, schools, churches and community organizations. Finally, the City of Chicago offered the Cooperative a \$650,000 grant through its Department of the Environment to operate in Pilsen.

### **Elgin**

Elgin is located about 40 miles northwest of downtown Chicago. Elgin has a vibrant civic life, centered around small business interests, the preservation of historic Elgin, and the improvement of the city. Elgin was chosen because a critical substation serves it and because the Cooperative's research found that Elgin was well organized. Neighborhood Housing Services (NHS) of Elgin was identified as a strong potential community partner. Several

faith-based organizations also expressed direct interest in working with the Cooperative to get both the word and products out to community members. Finally, local political leaders were enthusiastic about the Cooperative's mission and potential programs.

### **Park Forest**

Park Forest is an older, smaller suburb on the south side of Chicago. Park Forest was chosen because it is served by a critical substation, has experienced a degradation of electrical infrastructure, and has an exceptional inventory of social capital. Park Forest administrators were very interested in reducing energy costs for local businesses. Also, the Park Forest Village President was extremely knowledgeable of deregulation and had initiated dialogue with the National Rural Electric Cooperative Association on how Park Forest may become more energy independent. Finally, Park Forest is the location of several housing cooperatives (co-ops), which comprise 20-30 percent of the housing stock. The combination of the value that the Cooperative could provide to Park Forest and the unique social structure exemplified by the housing co-ops provided a good opportunity for the Cooperative.

### **Northwest Chicago**

Unlike the Cooperative's other target areas, Northwest Chicago was chosen solely because of its electrical situation, not because of social capital. Due to conditions at three local substations, Northwest Chicago had reached the capacity of its existing infrastructure. ComEd proposed this area because demand reduction could immediately impact plans for the new infrastructure investments that were needed. Northwest Chicago is not defined by community boundaries or by a shared understanding of community among its residents. It covers portions of several community areas in Chicago, as well as portions of several suburbs adjoining the city. The Cooperative found fewer organizations in Northwest Chicago than in the other target areas, and the organizations tended to be smaller. When added to the fragmented nature of the designated area, this made the Cooperative's community-based approach more difficult to apply. Instead, the Cooperative implemented a community-targeted approach in this area. This provided an opportunity for the Cooperative to test the flexibility of its approach.

### **Methods of Delivering Services**

To optimize effectiveness in delivering services, the Cooperative partnered with the existing organizational structure in each community. Community-based organizations offer unique doors into a community. The products and information offered by the Cooperative, as well as its long-term goal of improving a community's overall energy efficiency, create an attractive platform that many community-based organizations feel complement their particular community interests. In fact, many offer staff time, onsite facilities, and access to members via membership mail lists.

In each of the targeted communities, the Cooperative's first step was to contact local groups and organizations to begin building mutually beneficial relationships. This included community organizations, churches, local government, and even locally active individuals. The relationships with these community-based organizations were key to fostering a

community awareness of the unique energy demand of the community and the benefits of investing in energy efficient technologies and behavior. A comparison of community-based activities across the four targeted communities is presented in Table 1.

**Table 1. Comparison of Community-Based Activities**

Pilsen	Elgin	Park Forest	Northwest Chicago
Met with community leaders	Worked with the city council and met with key stakeholders	Worked w/members of City Council and Environmental Commission	Conducted a direct mail campaign
Participated in community events, such as the Street Fair	Participated in community events, such Energy Fair and Historic House Walk	Met monthly with advisory committee of community leaders	Subcontracted cold calls through a telemarketer
Conducted door-to-door sweeps using community members	Conducted a direct mail campaign	Participated in community events, such as Park Forest Earth Day and Farmer’s Market	
Held a raffle to win a window AC in which Cooperative membership was the entry for the raffle	Established relationship with Neighborhood Housing Services (NHS) to market and deliver window AC program	Established relationships with managers of housing co-ops	
Established relationships with churches and social service organizations to market the window AC program	Did a joint membership program with NHS to get the word out on the advantages of its services	Housing co-ops informed their members of the Cooperative and, in some cases, required their members to join the Cooperative	
Churches and social service organizations delivered the window AC program by serving as sites for the AC exchange	Used the NHS office as the site for the AC exchange		
Established a local office	Delivered program using local entities, such as contractors and trucking firms		
	Established a local office		

A community-based approach was prevalent in Pilsen, Elgin, and Park Forest, with varying levels of community involvement initiated by the Cooperative. The Cooperative used a community-targeted approach for the Northwest side, with little to no community-based activities. A summary of community-based activity is presented in Table 2.

**Table 2. Community-Based Activity Summary**

Activity	Pilsen	Elgin	Park Forest	Northwest Chicago
Met with community leaders	Yes	Yes	Yes	No
Attended community events	Yes	Yes	Yes	No
Marketed using community organizations	Yes	Yes	Yes	No
Delivered using community organizations	Yes	Yes	Yes	No
Office in community	Yes	Yes	No	No
Level of community-based efforts	High	High	High	Low

## Accomplishments and Lessons Learned

### Overview

This section presents the accomplishments and lessons learned from the first two years of the Cooperative's operation. Results are based on Cooperative reports (Community Energy Cooperative 2002a, 2002b) and evaluation findings (Pucket, Talerico, and Hall 2002). Evaluation activities included telephone surveys with 375 participants and 275 nonparticipants and in-depth interviews with program staff, community organizations, and market actors involved in program delivery.

Overall, the Cooperative efforts have demonstrated that developing a community-wide consciousness of energy issues requires time and effort. Although the strategy of blending the goals of the Cooperative with the goals of the community was extremely helpful because it translated into immediate credibility and willingness to work with the Cooperative, fully mobilizing the targeted communities around energy issues is a multi-year process. For example, there was hesitancy among some community members about the AC program because it seemed "too good to be true." As a pilot program, the Cooperative has to prove its legitimacy because it is new and relatively unknown.

### Membership and Program Penetration

**Accomplishments.** The Cooperative demonstrated that significant demand reductions are possible using community-based efforts in geographically targeted areas. The Cooperative has recruited over 5,800 residential members. These members have replaced over 7,200 old, inefficient window ACs with new, efficient Energy Star models and 700 old, inefficient CACs with new, more efficient models. These replacements have resulted in estimated demand savings of about 6.1 MW. Results are presented in Table 3. In addition, the Cooperative's Community Benefits Fund has granted almost \$200,000 to non-profit organizations for various selected community projects.

**Table 3. Membership and Program Penetration through 2001**

Activity	Overall	Pilsen	Elgin	Park Forest	Northwest Chicago
Level of community-based efforts	--	High	High	High	Low
Households (based on 2000 Census)	136,456	30,932	26,567	7,715	71,242
Members	5,844	2,709	723	998	1,414
Membership penetration	4.3%	8.8%	2.7%	12.9%	2.0%
AC sales	7,930	3,430	1,100	700	2,700
AC program penetration	5.8%	11.1%	4.1%	9.1%	3.8%
Estimated MW reduction*	6.1	2.4	0.8	1.0	1.9

\* Demand reduction estimates are based on a program assumption of 0.7 kW saved per window AC and 1.4 kW saved per CAC.

Pilsen and Park Forest have the highest membership and AC penetration rates. Pilsen's higher penetration is due in part to the fact that the Cooperative was involved in Pilsen for two years, compared to only one year for the other communities. Park Forest's higher penetration is due in part to the fact that some housing co-ops required their members to join the Cooperative and replace their CACs.

**Lessons learned.** The Cooperative found that it is more efficient to work with small aggregates of residents, such as housing co-ops, rather than with each resident individually. This was exemplified by the CAC program's success in Park Forest, where the vast majority of CACs were sold to the housing co-op members. The success of the CAC program in Park Forest is attributable to the Cooperative staff directly marketing the CAC program to management staff at the housing co-ops. In Pilsen, Elgin, and Northwest Chicago, the Cooperative relied on contractors to market the CAC program to individual homeowners. To attract higher sales volumes within these areas in the future, the Cooperative needs to develop more effective partnerships with contractors and possibly restructure the incentive offered to its members.

The Cooperative also learned that its AC programs need to provide a varied selection of AC types to suit the particular housing characteristics within a community. For example, a significant number of Park Forest residents have casement windows; and since the window ACs offered by the Cooperative did not fit in casement windows, these customers could not participate in the program. Also, many of the large, multi-unit buildings in Northwest Chicago have through-the-wall, not window, ACs; and through-the-wall units were not part of the initial AC program. These examples represent opportunities for the Cooperative to expand its AC program offerings to increase penetration in Park Forest and Northwest Chicago.

Finally, the Cooperative learned that it needs to expand service offerings to continue building membership. The Cooperative is currently expanding its role at providing a third-party perspective on energy issues, especially with regard to education on the ramification of utility deregulation on pricing and supply. Also, the Cooperative began a Natural Gas Price

Protection Plan pilot program in late 2001 to provide relief from the anxiety of rising gas prices. This program involves the use natural gas options and education of members about natural gas efficiency and steps to reduce heating costs.

## Relationships

**Accomplishments.** The Cooperative has worked very effectively with community organizations and key stakeholders. Stakeholders report that the Cooperative is a strong capable organization providing valued services and are impressed with the Cooperative’s ability to engage communities. Also, the use of a community-based approach has enhanced the Cooperative’s image among community organizations. Communities want to continue working with the Cooperative, are impressed with the Cooperative’s staff, and think that customers are happy with the programs.

Participant satisfaction ratings are presented in Table 4. Participants are very satisfied with the Cooperative (8.8) and the AC programs (9.2). Satisfaction with the Cooperative is highest in Park Forest while satisfaction with the AC programs is highest in Pilsen. Participants also rate their satisfaction with program attributes highly. Finally, participants report that involvement with the Cooperative has enhanced satisfaction with ComEd.

**Table 4. Satisfaction Ratings\***

Activity	Overall	Pilsen	Elgin	Park Forest	Northwest Chicago
Level of community-based efforts	--	High	High	High	Low
Mean satisfaction rating for Cooperative	8.8	8.3	8.3	8.9	8.3
Mean satisfaction rating for AC programs	9.2	9.4	9.1	9.1	9.1

\*Satisfaction ratings are on a 1 to 10 scale, where 1 means “extremely dissatisfied” and 10 means “extremely satisfied.”

**Lessons learned.** In developing relationships within the communities, the Cooperative learned that it not only had to meet the energy needs of individuals, it also had to meet the needs of the partner organizations. The Cooperative learned that these organizations have much to offer if they can also benefit from a partnership.

The Cooperative also learned the importance of advance planning to avoid burdening the staff and resources of community partners involved in the delivery of Cooperative programs. For example, the window AC program operations in Elgin overwhelmed NHS staff for two weeks because the Cooperative did not anticipate the high initial demand.



## Marketing

**Accomplishments.** The Cooperative has built a solid foundation on which to market products and services to existing members and expand membership among non-members. Eighty percent of members who purchased an AC through the Cooperative are aware of the Cooperative, an indication that the Cooperative has established its identity among members. In addition, 26 percent of nonparticipants are aware of the Cooperative. Results are presented in Table 5. Interestingly, awareness of the Cooperative is highest in Elgin and lowest in Pilsen; whereas, membership and AC program penetration rates are highest in Pilsen and second lowest in Elgin (Table 3).

**Table 5. Awareness Levels**

Activity	Overall	Pilsen	Elgin	Park Forest	Northwest Chicago
Level of community-based efforts	--	High	High	High	Low
Percent of participants aware of Cooperative	80%	70%	82%	81%	79%
Nonparticipants aware of Cooperative	26%	18%	31%	29%	24%
Percent of participants listing Cooperative as one of AC program providers	31%	26%	27%	37%	37%

**Lessons learned.** The Cooperative needs to better establish that it is responsible for providing the AC program to its members. As shown in Table 5, only 31 percent of members who purchased an AC from the Cooperative said that the Cooperative had a role in providing the AC program. ComEd and community organizations were cited by 30 and 28 percent of participants, respectively. This indicates that ComEd's sponsorship and program delivery through community organizations focused attention away from the Cooperative.

Cooperative contact with customers needs to be frequent and consistent in its message. The Cooperative should also continue to provide an offering, such as the Energy Kits, that demonstrates value at the time of enrollment. In addition, membership acknowledgement should be initiated at the time of enrollment or soon thereafter. Finally, the Cooperative should consider implementing more one page direct mail pieces about what the Cooperative is doing. This gets the Cooperative's logo more exposure and gets members accustomed to the idea of membership.

The predominance of Spanish language speakers in Pilsen meant that everything the Cooperative did had to be bilingual. This was especially complicated because energy efficiency is not a current topic in the Spanish media. The Cooperative had to discover a Spanish vocabulary for a discussion of energy efficiency and energy savings.

The Cooperative found that it could easily deliver the messages of energy efficiency and awareness of the community's load profile as a whole in areas where a community-based approach was used, especially in Park Forest. It was a challenge, however, in Northwest Chicago to deliver a message about the benefits, identity, and purpose of the Cooperative when almost all of the contact with members was through the mail.

## Conclusions

The Cooperative has successfully used community-based efforts to reduce peak energy demand in geographically targeted areas. These efforts have optimized the delivery of energy efficiency programs by concentrating services in areas in need of electricity infrastructure improvements. The benefits of these efforts have accrued to individuals, the communities in which they live, and ComEd. Finally, the membership base established by the Cooperative provides a foundation on which to offer additional services, such as aggregation of purchasing power, that will help sustain the Cooperative's viability in a deregulated electricity market.

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