

Case Study — Chicago Area Energy Savers Program May 2011

In Brief

Location: Cook and Lake Counties, Illinois
Lead organization: CNT Energy — a division of the Center for Neighborhood Technology
Policy type(s): Multi-Family Homes, Low-Income Programs, Retrofits, Energy Efficiency Financing
Sector: Residential
Start Date: 2007
Summary: The Energy Savers program offers free energy audits, technical support, and retrofit financing for building owners of affordable, multi-family residential buildings in Cook and Lake Counties.
Impact: Over 5,000 rental apartment units in the Chicago region have been retrofitted through the program. On average, improvements have cut energy costs by 30% and saved building owners and tenants \$10,000 per year. Other results include 1,000,000 therms saved, 5,000 metric tons of carbon dioxide emissions avoided, direct creation of 75 jobs, and preservation of affordable rental housing through reducing utility bills.

Overview

The Energy Savers program, launched in 2007, offers free energy audits, technical support, and energy retrofit financing for owners of multifamily residential buildings offering rents affordable to low- to moderate-income households in Cook and Lake Counties, Illinois, including the City of Chicago. The depth and scope of each retrofit are tailored to meet the needs of each building owner. Energy Savers retrofits include adding insulation, air sealing, HVAC systems improvements, hot water, and lighting systems. The program aims to reduce building energy consumption by 30% on average and serves multifamily residential owners who offer affordable rents for low- to moderate-income tenants earning 80% or less of Area Median Income (AMI). Approximately half of Chicago’s residents live in multifamily housing.

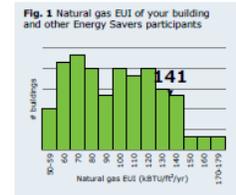
Seventy percent of Chicago’s global warming emissions come from buildings. In 2008, a mayoral-appointed task force created the *Chicago Climate Action Plan (CCAP)*, which was authored by multi-stakeholder committees

Q. What else will Energy Savers do for me?

- A.** Now that we’ve determined what improvements should be made, CNT Energy will help you
- develop a plan to implement our recommendations.
 - solicit and review bids from the appropriate contractors.
 - schedule installation work and perform quality-control inspections.
 - track the performance of your retrofitted building by reviewing utility bills. We will provide an annual performance report, including a tune-up if your building is underperforming.

Q. How does my building compare to other buildings?

A. Energy-use intensity (EUI) is a useful metric for comparing buildings of different sizes. It is the total energy used by the building in one year divided by the total heated area, expressed in thousands of BTUs per square foot per year (kBtu/ft²/yr). Buildings with low EUIs use energy more efficiently than buildings with high EUIs. Here we concentrate on natural gas, which dominates total consumption. We use the most recent year of data from your gas provider and estimate total heated area from satellite imagery and our site inspection. The resulting EUI is shown in Fig. 1 along with a histogram of other Energy Savers participants.



Natural gas consumption can be broken into two parts: base load and heating load. The base load represents the gas used by water heaters and other gas-powered appliances throughout the year. We estimate it as the average of the summer bills, when the building is unheated. Everything above this is assumed to be the heating load. Table 3 shows how your building’s natural gas EUI is split into base load and heating load, and how they compare to other buildings in our program.

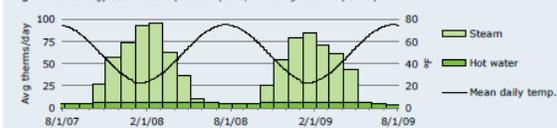
Table 3 EUIs for natural gas base load and heating load (kBtu/ft²/yr)

| | Natural gas base load | Natural gas heating load | Total natural gas load |
|--------------------------------|-----------------------|--------------------------|------------------------|
| Average Energy Savers building | 24 | 75 | 99 |
| Your building | 20 | 121 | 141 |
| Percent with lower EUI | 40 | 92 | 88 |

Q. How does my energy use vary during the year?

- A.** Natural gas use follows a seasonal pattern. Consumption is highest in the winter because of the need for space heating. It is lowest in the summer—but not zero—when only the water heaters consume natural gas.

Fig. 2 Billed energy use over the past two years, in average therms per day



and enjoys wide buy-in and support from local elected officials and key partners. Amongst its provisions, the CCAP calls for the retrofit of 400,000 residential units by 2020 in order to achieve a 25% reduction in the City's greenhouse gas emissions. As of 2010, the city's total retrofit capacity was calculated as 8,900 units per year. At this rate, the city will not be able to reach its goals. Two key barriers are lack of information and high transaction costs.

To overcome these barriers, the Energy Savers program, managed by CNT Energy, streamlines the interface between multifamily building owners and retrofit contractors by providing a single source of information and tailored technical support. After owners fill out an online application, CNT Energy Analysts coach them through all phases of retrofitting. This way, owners enjoy one single point of contact through an otherwise complex process that involves multiple decision points and actors. According to CNT Energy's [Web site](#), Energy Savers "provides a one-stop energy efficiency shop where owners of multifamily buildings can access technical assistance, financing and construction oversight, plus annual performance monitoring." The Community Investment Corporation (CIC) can provide special financing to pay for energy-related improvements: half of prime rate (with a floor of 2%) fixed for seven years. Participants can also take advantage of grants and rebates offered through their gas and electric utilities for upgrading boilers, furnaces, hot water heaters, appliances, and attic insulation to meet ENERGY STAR standards. ComEd is the region's primary electric utility.

Management and Funding

Multiple organizational partners support the Energy Savers program. The program is spearheaded by The Preservation Compact, a public/private partnership working to preserve and improve the supply of affordable rental housing throughout Cook County. CNT Energy administers the program with the Community Investment Corporation as its primary partner. CNT also sits on the advisory board of the Lake County Preservation Initiative and works closely with partners in that county. Other major supporters include the MacArthur and Polk Brothers Foundations, the City Department of Housing and Department of Environment, the Illinois Attorney General's Office, the Department of Commerce and Economic Opportunity, and the Chicagoland Natural Gas Savings Program, which is administered by the local natural gas utilities Peoples Gas and North Shore Gas. CNT Energy also works with the Urban Land Institute.



An energy auditor with the Energy Savers team conducts a blower door test to check for air leakage.

Energy Savers capitalizes on a network of community partnerships to recruit participants, working through relationships with the Community Investment Corporation, the Chicago Housing Authority, and the Department of Housing and Community Development, among others. CNT Energy has also reached owners through the neighborhood property owner groups such as the Rogers Park Builders Group and the South Side Builders Associations. Builders groups or associations are membership organizations for real estate professionals, financial institutions, and property owners who have a common interest in revitalizing or developing a certain neighborhood. Most of the participants came to the program via partner or network referrals.

Participants must apply online or mail/fax an application (90% apply online). After CNT receives the application, it analyzes the building's energy consumption and schedules a building audit. The analysis and audit are offered at no cost to the owner because of foundation and utility company support. After the audit, Energy Savers generates a report of recommended upgrades. Energy Savers construction managers work with the energy analysts to tailor the depth or scope of retrofit to meet each owner's needs; their analysis looks at the entire building envelope, HVAC systems, hot water, and lighting equipment. Reports also provide information on financing options, including the below market rate loan program from CIC.

When the owner has secured financing and is ready to find contractors, CNT helps the owner solicit bids based on the owner's personalized scope of work. CNT has a list of preferred contractors who are licensed, bonded, and insured, and have experience working on multifamily systems, which tend to be larger and more complex than those found in single-family homes. CNT then helps oversee the construction process by checking for quality control and to ensure standards are met. At the end of the project, CNT helps to monitor the owner's energy bills to verify savings. Annual savings reports are provided for the first two years after retrofit. If the building does not meet projected savings, CNT offers a tune-up consultation.

Performance

Energy Savers has received national recognition as one of the country's most successful multi-family retrofit programs and for its quick delivery of program objectives: maintaining affordability of regional rental housing, establishing new jobs, and reducing energy consumption. Chicago's Mayor Daley presented CNT Energy a 2010 audience choice Greenworks Award for "sustainable innovation in the built environment." Since 2007, over 5,000 rental apartment units in the Chicago region have been retrofitted, another 2,500 were in construction in early 2011, and another 4,000–5,000 units are estimated to be completed by the end of 2011. On average, improvements have cut energy costs by 30% and saved building owners and tenants \$10,000 per year. Retrofit work has cost a total of roughly \$11,750,000 (averaging \$2,500/residential unit). The results are over 1,000,000 therms saved, 5,000 metric tons of carbon dioxide emissions avoided, and preservation of affordable rental housing through reducing utility bills.



Energy improvements made through Energy Savers improve the comfort of affordable apartment buildings such as this one on South Parnell Avenue in Chicago.

In addition to energy savings, the program has created jobs for the contractors who implement the Energy Savers team's energy efficiency recommendations, energy auditors, insulations specialists, and heating contractors. In total, more than 75 jobs have been created in the past three years from the Energy Savers program. Another 165 jobs are expected over the next two years. The Energy Impact Illinois initiative, started as a result of the regional award of a \$25 million competitive block grant, will expand energy efficiency retrofit efforts to all seven counties of the Chicago metropolitan region in the coming years. This expanded program, funded by the U.S. Department of Energy's Energy Efficiency and Conservation Block Grant Program, could produce as many as 2,000 new jobs.

Lessons Learned

Currently, Chicago is ranked number four in energy-efficient buildings by ENERGY STAR. Energy Savers has contributed to this success and demonstrated that programs can achieve economies of scale by targeting the multifamily sector. However, multifamily buildings present a set of particular challenges in terms of building systems, maintenance, and tenants. Relationship management is a key component for success.

- Patience is an important virtue in the one-stop-shop. Program managers must be good communicators and sympathetic to the needs of owners. It can take many conversations before owners feel secure in making energy efficiency investments. The program managers must have the right temperament to shepherd owners through the many phases of making technical decisions.
- In low-income properties, even those that are cash flow positive, there is not as much money available to make improvements, so program managers and analysts must focus on communicating to owners about what is cost-effective, rather than the latest or most efficient technology.
- Having an expert lending partner has also been key for program success. After the audit is done, it is important that owners have an easy go-to place for assessing the financial feasibility of a retrofit investment. As a key partner, the Community Investment Corporation is committed to making rehab deals that work for multifamily owners. The CIC's investment in the program has been important for ensuring that the process doesn't die after the audit.
- The Energy Savers program has drawn on a number of funding sources and networks, and recruiting supportive stakeholders has been key to sustaining the program. Over the three-year period, different funding supports have come forward as the program has evolved and demonstrated success in lowering energy consumption, maintaining affordable housing, and returning value to investors. The program enjoys utility, public, and philanthropic support, all of which makes the platform more robust and allows the program to craft a package of services and incentives that meets each building owner's needs.

Related Resources

Energy Savers home page. <http://www.cntenergy.org/buildings/energysavers/>

"CNT Energy Wins Greenworks Award for Energy Savers Program."
<http://www.cntenergy.org/2010/12/02/cnt-energy-wins-greenworks-award-for-energy-savers-program/>

"Event Highlights Energy Efficiency Solutions for Apartment Buildings."
<http://www.cntenergy.org/2010/12/07/video-event-highlights-energy-efficiency-solutions-for-apartment-buildings/>

Sample Energy Savers Energy Audit Report. <http://www.cntenergy.org/media/Sample-Energy-Savers-Report.pdf>

Energy page of the Chicago Metropolitan Agency for Planning, including details on the developing regional retrofit program. <http://www.cmap.illinois.gov/energy>

Energy Programs Consortium report on the national opportunities and challenges for energy efficiency in multifamily housing. <http://www.energyprograms.org/briefs/0706.pdf>

Contact

Peter Ludwig, Energy Efficiency Programs Manager, CNT Energy, (773) 269-4048, peter@cntenergy.org

This case study was developed by Amy Stitely (Massachusetts Institute of Technology), Chelsea Haines (Monterey Institute of International Studies), and Eric Mackres (ACEEE).