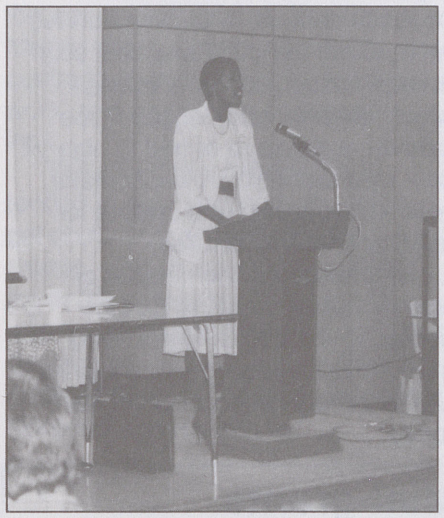
Nonprofit Energy News

A Newsletter for Nonprofit Organizations in Southeastern Michigan

An Energy Works Publication of the Ecology Center, Ann Arbor, Michigan

Fall 1988 Vol.1 No. 1



Jane Morgan of Community Foundation at the first Nonprofit Energy Workshop

Energy Works Team Offers Services to Nonprofits

The Ecology Center's Nonprofit Energy Works program is offering services to improve the energy efficiency of the facilities used by nonprofit organizations throughout Southeastern Michigan. The program offers free education, technical services and financial assistance designed to save participating organizations as much as 30 percent on energy bills. Thus, more of an agency's funds can go where

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Community Foundation Announces Energy Initiative Grants and Loans

Nonprofit organizations may now apply for 3 types of grants and low interest loans for energy conservation projects through the Community Foundation for Southeastern Michigan's Energy Initiative Program.

The Foundation has over $2 million available to support energy conservation activities. These funds have been provided by a State of Michigan appropriation of $1.1 million in Exxon oil overcharge settlement funds which has been matched dollar for dollar by private sources. Major sources of matching funds include the Kresge Foundation, McGregor Fund, Detroit Edison, MichCon Foundation, Consumers Power Company/CMS Energy Fund and the Community Foundation for Southeastern Michigan.

Non profit organizations with 501 (c)(3) status located in Wayne, Oakland, Macomb, Monroe, Livingston, Washtenaw and St. Clair Counties are eligible. The four assistance categories are 1) General Energy Initiative Program Grants, 2) Technical Assistance Grants, 3) Energy Initiative Capital Grants, and 4) Energy Initiative Loans.

General Energy Initiative Program Grants are available for any creative and innovative energy conservation projects which comply with State Energy Conservation Program (SECP) guidelines. These guidelines prohibit using funds for building construction, repair or renovation or for the purchase and installation of energy conservation equipment and materials. For more detailed information about (SECP) restrictions, a copy of the guidelines may be obtained from the Community Foundation. Eligible projects in this category might include the preparation and distribution of energy conservation publications or education and training targeted at

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they're needed most-- into services.

Energy is the fastest growing budget category of nonprofit agencies in Southeastern Michigan. Those that own their buildings currently spend a total of $55 million a year on energy, of which $15 million could be saved. Nonprofits, however, are usually unfamiliar with new energy saving technologies and devices. Naturally, energy efficiency is less a priority than service delivery. There is not enough staff time for planning and coordinating a well researched energy efficiency project. Moreover, a shortage of capital and credit history inhibits borrowing clout. Nonprofit Energy Works aims to remove such barriers.

The Project Team is equipped to provide telephone consultations, site visits, and educational materials on energy questions and issues. A data base is also being developed to track such information as building characteristics, energy savings, consumption patterns, and information on other energy programs. Most nonprofit agencies will qualify for some if not all of N.E.W.'s services; however schools, hospitals, government, and senior citizens agencies may be referred to other energy assistance programs. N.E.W.'s outreach and education strategy is targeted to reach at least 3,500 nonprofit agencies in Wayne, Oakland, Macomb, Washtenaw, St. Clair, Monroe, and Livingston Counties. This issue of *Nonprofit Energy News* marks the first of three educational publications to be received by nonprofit organizations

Workshops

In addition to receiving this newsletter, nonprofits can attend one of 8 Nonprofit Energy Workshops scheduled this fall at various locations (see back page listing). The workshops will focus on do-it-yourself techniques for maximizing energy savings; how to obtain an energy assessment and technical services; and the pursuit of mini-grants and other funding options.

Energy Assessments

The Nonprofit Energy Works Team is offering free energy assessments to eligible nonprofit agencies that are interested in receiving a mini-grant.

An energy assessment leads to smart energy efficiency investments. The goals of an energy assessment are to determine: how energy is used in a facility; areas of significant energy waste; what changes could be made to save energy; how much these changes will cost; and how quickly the changes can pay for themselves through reduced energy bills. All energy conservation measures will pay for themselves. However, an energy assessment will determine which energy conservation measures make the most sense considering the financial resources available to an organization.

An energy assessment involves several steps requiring the participation of the recipient agency. The agency will first need to identify its own in-house "energy team" to work with the Nonprofit Energy Works Team in gathering information about the facility.

Then the organization will complete and return aquestionnaire (available at workshops or by phone request). After reviewing the questionnaire and determining eligibility, a site visit will be arranged.

Site visits will be conducted by Team Architect Bob Tinker, Team Engineer Larry Wiggins, and other qualified project representatives. Together with the agency's own "energy team" they wil tour the facility to identify energy use patterns and problems. Energy saving opportunities will be pointed out; areas that should be pursued in a technical audit will be noted; and questions from the agency will be answered. Information about related issues (such as occupant comfort and indoor air quality) may also be provided.

The N.E.W. Team will also arrange for a utility company audit of the facility if the agency has not had one. Detroit Edison and MichCon have agreed to offer free audits as part of this program. The utility auditor will also need to gather data about the facility such as building measurements, insulation levels, and equipment types and sizes. This information will be used in a computerized analysis of the facility.

The Nonprofit Energy Works Team will combine the information gathered from the site visit and the utility audit to produce a detailed report for the agency. The report will include: a summary of all energy conservation measures appropriate for the facility, including implementation costs and dollar payback periods; a package of recommended "no cost" and "low cost" energy conservation measures which are mini-grant eligible (see below); a package of mid to high cost measures which would make wise investments; and options for funding these measures.

Unfortunately, the number of energy assessments to be conducted is limited. So get a head start on saving energy--and money. Contact Nonprofit Energy Works today.

Mini-grants

Through the Community Foundation, Nonprofit Energy Works is offering mini-grants to fund the installation of low cost energy conservation measures. Implementing low cost measures is the first and most important step to saving energy. Low cost measures will yield the greatest dollar savings in the shortest amount of time, and often pay for themselves within a year or two of implementation.

The mini-grant procedure will be fast and simple. As part of the assessment, a package of grant eligible energy conservation measures will be identified and summarized on the energy assessment. The Nonprofit Energy Works Team will facilitate the application process, outlining the recommended energy conservation measures to be performed as part of the agency's mini-grant application. Such measures may include caulking and

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weatherstripping doors and windows; modifying heating and cooling equipment and controls; and replacing existing lighting with more efficient lamps and fixtures. Some low cost measures can be implemented by agency personnel, which increases the amount of work which can be accomplished with the grant.

Upon approval the Community Foundation will send the full amount directly to the grantee. The recipient nonprofit organization will be responsible for payment to contractors. Nonprofit Energy Works will assist the agency in implementing the funded measures by identifying contractors, inspecting completed work, and monitoring energy savings.

The mini-grant program is intended to help nonprofit agencies get started on an energy saving course. Those agencies participating in the mini-grant program will also be given consideration for other Community Foundation grants and loans. For more information contact Nonprofit Energy Works.

Who is Nonprofit Energy Works?

Nonprofit Energy Works is a special project of the Energy Works division of the Ecology Center, a nonprofit environmental organization located in Ann Arbor, in conjunction with Marygrove College of Detroit. The N.E.W. Team consists of experts from Conklin & Associates, Architect Bob Tinker, Environmental Technology Company, Residential Energy Conservation Consulting Group, and Technical Development Corporation. Other participants and sponsors include the United Foundation, area United Way chapters, Goodwill Industries of St. Clair County, local utility companies, and area UAW locals.

Since the energy shortage began to affect us in the early 1970's, the Ecology Center's Energy Works Program has actively promoted energy awareness and savings by providing education and technical services. These include Home Energy Visits for low and moderate income households, an energy resource library, assessments and workshops. Energy Works has provided program and consultation services throughout Southeastern Michigan.

The mission of the Ecology Center is to channel community resources to address local environmental needs by providing information, services and demonstration projects. With a current staff of 30, over 350 volunteers, and 2,400 members, the Center has developed many successful programs. Besides Energy Works these include Household Toxics Education, a Pesticides Task Force, an environmental outreach library, and Recycle Ann Arbor, which provides recycling services and waste reduction education.

DOES YOUR SPRING TUNE-UP SPECIAL INCLUDE POINTS, PLUGS, AND CONDENSER?

Nonprofit Energy News
is a publication of Nonprofit Energy Works, a program of the Ecology Center.

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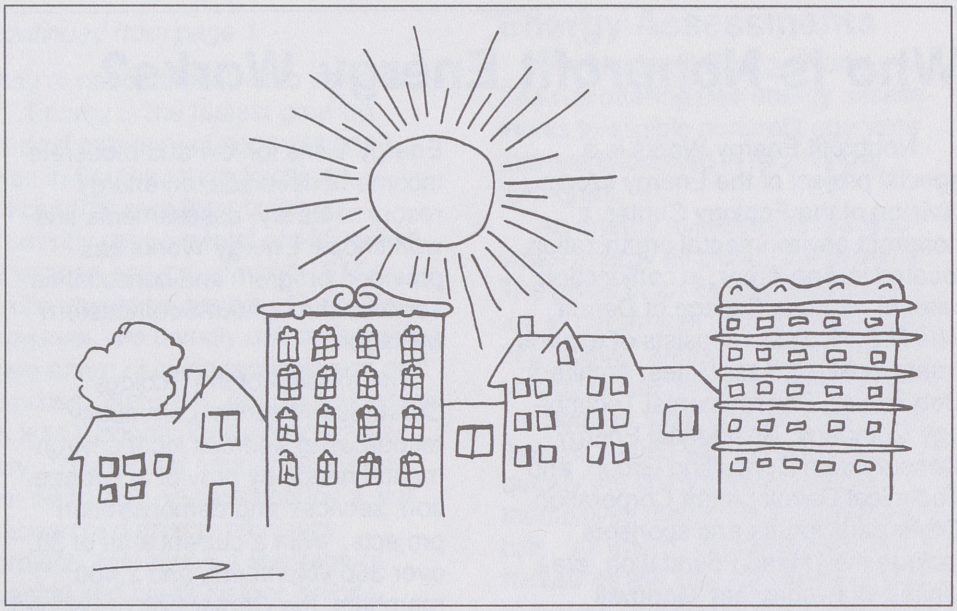

Robin Hite

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groups such as low income populations, building maintenance personnel or the general public (e.g. schools, clubs, neighborhood organizations).

Technical Assistance Grants are available to assist applicants in obtaining technical analysis or advice regarding energy conservation projects. These grants can cover the cost of obtaining technical expertise to conduct a detailed analysis of a facility's energy use and conservation needs; professional fees involved in negotiating financing for energy efficiency improvements, or conducting energy analyses of the homes of low income residents. These grants must also meet SECP guidelines.

Energy Initiative Capital Grants are available to organizations that have had a detailed energy analysisof their building. These grants will pay for the purchase and installation of energy conservation equipment and materials, energy conservation-related construction or repair of buildings or structures and other energy-related capital expenses. In most cases grants for capital projects will be limited to a portion of the total project budget and projects that have an energy savings payback of 10 years or less.

Non-profit organizations who have obtained an energy analysis may also apply for **Energy Initiative Loans** of up to $100,000 (through Comerica Bank-Detroit, Manufacturers National Bank of Detroit and the National Bank of Detroit) for the purchase and installation of energy conservation measures for their agency or for low-income residents. Once the loan is made by a participating bank the Community Foundation will subsidize the effective rate of interest to a level of 3 percent. While the establishment of loan criteria is at the discretion of each participating bank it is likely to include some or all of the following:

- 5 years minimum incorporation
- 3 year history of balanced operations with stable funding sources
- Positive working capital (current assets greater than current liabilities)
- Debt service capacity equal to 1.2 X annual debt service
- Loan to project cost ratio of .80. This can be achieved either through equity in the project on the part of the borrower or through obtaining an Energy Initiative Capital Grant from the Foundation.

Loan applicants should own or hold long-term leases on their facilities. Those leasing should have the agreement of the landlord not to impose rent increases for a period of 12 months following completion of the work. Intermediary organizations may apply for loans to assist low-income residents of rented or owned property. Loans will also be limited to a portion of the total project budget and will be for projects with an energy savings payback of 10 years or less.

All grants and loans are competitive and may be requested quarterly until funds are expended. The deadlines for submitting applications are the first of March, June, October and December beginning October 1988. It is estimated that funds will last through September 1990.

Over time a nonprofit organization may apply for assistance from several categories. By participating in the Nonprofit Energy Works Program (N.E.W.), nonprofits can obtain technical services needed for seeking Community Foundation grant assistance while beginning to explore energy conservation opportunities. Nonprofits receiving assistance from N.E.W. may later apply for a Capital Grant and/or Loan. It is possible to submit applications for an Energy Initiative Loan and Grant concurrently or in sequence.

Applications can be obtained from:
Community Foundation for Southeastern Michigan
333 West Fort St., Suite 2010,
Detroit, MI 48226,
(313) 961-6675.

For more information contact:
Nonprofit Energy Works
417 Detroit St., Ann Arbor, MI 48104,
(313) 747-7904.

Increase Your Energy Word Power ..... It Pays!

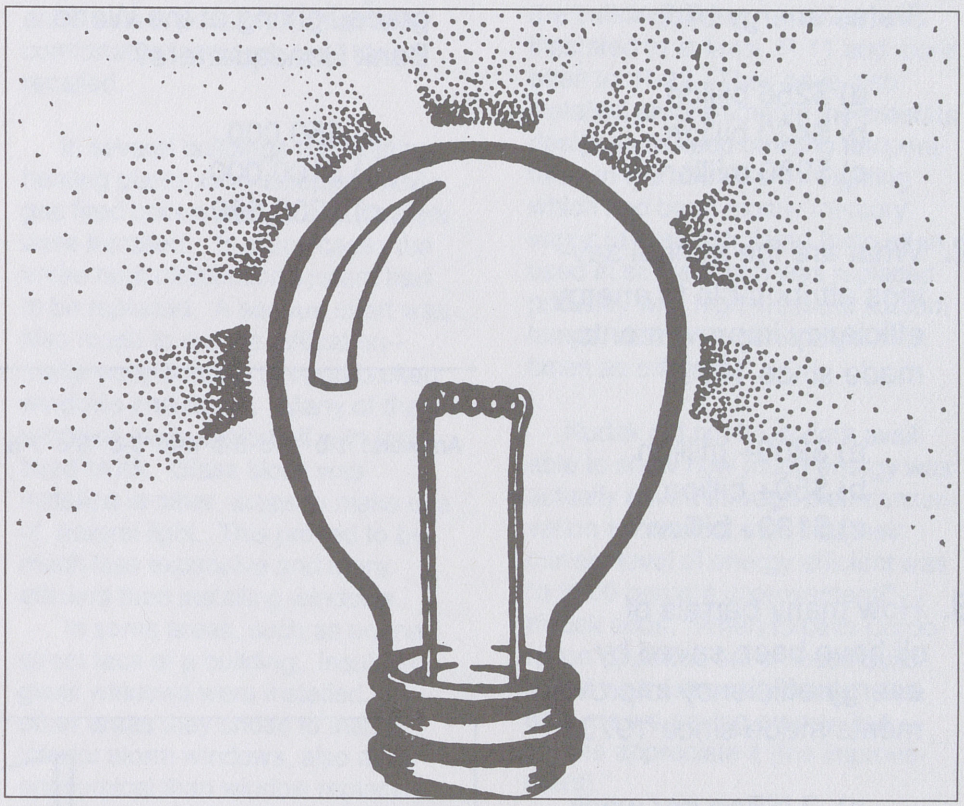
BTU - British Thermal Unit: The standard unit for measuring energy. One BTU is equal to the amount of energy needed to heat one gallon of water one degree Fahrenheit. It takes 300 BTU's to heat a quart of 62 degree tap water to boiling (212 degrees).

CCF - One hundred cubic feet: A common unit for measuring natural gas. One CCF natural gas = 103,100 BTU's.

KWH - Kilowatt Hour (1,000 watt-hours): A common unit measuring the flow of electrical power. A 100-watt lamp burning for 10 hours consumes 1 KWH of energy or 3,412.8 BTU's.

BBLS - Barrels: Common unit of measure for crude oil or residual oil (1 bbl = 42 gallons). One bbl of residual oil equals 6,2900,000 BTU's.

End use - Refers to the use to which the energy resource (gas, electricity, oil) is put, such as space heating, lighting, cooling, operating appliances, etc.



Robin Hite

R-factor or R-value - A measure of ***resistance*** to heat flow, or the amount of heat energy that ***is not*** flowing through the roof and walls. The higher the R-Value, the better the insulation. Buildings being constructed today should have a value of at least R-30 in attics.

Infiltration - The presence of (often undetectable) air leaks or drafts in a building, causing colder air to seep in (infiltrate) as warmer air is lost (exfiltrates).

Low Cost / No Cost Measures - Basic energy conservation techniques which cost little or nothing to implement but often result in the greatest opportunity for energy savings. An example would be adjusting the thermostat, installing a timer, or fitting a blanket around the hot water heater.

Simple Payback -The time (months, years) it takes for an energy conservation measure to save as much money, through reduced utility bills, as the cost of implementing the measure.

Compiled by Paula Ruth Conner

ENERGY TRIVIA QUIZ

1. What is the annual United States energy bill?

a) $250 billion
b) $420 billion
c) $980 million

2. What are the annual savings attributable to energy efficiency improvements made since 1973?

a) $200+ million
b) $50+ billion
c) $130+ billion

3. How many barrels of oil have been saved by energy efficiency improvements made since 1973?

a) 2 billion per week
b) 13 million per day
c) 6 million per day

4. What is the market price of Middle East oil as of January, l988?

a) $18 per barrel
b) $25 per barrel
c) $42 per barrel

5. How much could be saved in one year if the U.S. converted to best available lighting technology?

a) $30 million
b) $300,000 million
c) $30 billion

6. How much did it cost to upgrade lighting at the World Bank Headquarters?

a) $50,000
b) $100,000
c) $200,000

7. How much did the World Bank headquarters save in electric costs in 1984?

a) $80,000
b) $100,000
c) $500,000

Answers: 1-b 2-c 3-b 4-a 5-c 6-c 7-b

Source: "Energy Index", compiled by Judy Christrup. *Greenpeace.* V.13(2)1988

Focus: Hope's Building Improvements Enhance Comfort *and* Budget

by Cynthia Conklin

Focus: Hope, directed by Father William Cunningham, is an innovative and widely renowned nonprofit agency in Detroit, which can boast of many "firsts." They were one of the first agencies in the Country to provide comprehensive, nutrient balanced food programs for mothers, infants, and senior citizens. They have pioneered in challenging race and sex discrimination in the work place both through the legal system and by creating alternative education and economic institutions. They are providing training to Detroit workers in the skilled trade of machine tooling and manufacturing machine parts. (Most notable in this regard is the Cycle Tec operation which is remanufacturing transmissions for General Motors, an operation grossing $8 million last year.) They are coordinating nutritional support, day care, training and employment in a showcase program deserving of attention by anyone who takes local economic development seriously.

According to Ken Kudek, Assistant Director of Focus: Hope and General Manager of Cycle Tech, their commitment to energy conservation has forged ahead with the same zeal. This became especially evident when in 1981 the agency acquired approximately 360,000 square feet of industrial floor space in a 5-building complex previously owned by Excello Corporation, and which now houses machinist training and Cycle Tec operations.

Built in the 1920's to 1930's these buildings were in desperate need of renovation. At least 10 percent of the windows were missing and infiltration (air leakage) loss was severe. "In the winter workers could watch the snow blowing in, and it was impossible to maintain comfortable temperatures," Kudek recalled.

In several buildings the existing heating plants were scrapped while gas fired boilers and radiant heaters were installed. In many cases the entire heat distribution system had to be replaced. A serious effort was also made to reduce infiltration--drafts were pouring through broken windows and doors. Many of the windows were sealed off with insulated block. Glass block was installed in other areas to make use of natural light. This proved to be much less expensive and more efficient than installing windows.

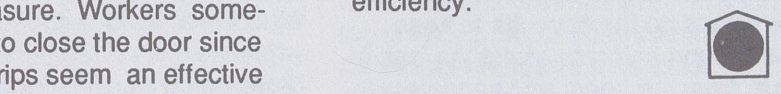
In some areas, such as on the street face of a building, insulated glass windows were installed. In other areas they chose to install interior storm windows, also more economical than window replacements, to reduce infiltration and heat loss from leaky windows. In yet other areas they used special rigid insulating materials in fabricating window treatments. These materials, which Kudek describes as having the texture of " a kit kat bar," can increase the R factor of a closed window to as much as an R-11.

On many overhead doors, strips of plastic were hung to reduce winter heat loss caused by doors opening for vehicle entry or exit. However Kudek noted two common problems with this measure. Workers sometimes forget to close the door since the plastic strips seem an effective barrier to wind and cold. Secondly, at certain angles to the sun it is difficult to see through the plastic, resulting is safety risks. He feels that with worker training both of these problems can be overcome.

In addition to improving heating plants and reducing air leakage, all the buildings were re-roofed and insulated to at least R-11 and more often to R-22. They have also installed programmable thermostats designed to keep building temperatures in the mid 60's F. Lighting which had been mostly mercury vapor (a greenish tinted lamp often used in street lights) was replaced primarily with high pressure sodium lamps, which are generally 2 to 3 times as efficient.

Kudek did not have data available to show how much energy was actually saved through their conservation efforts, but said that their current level of energy efficient was "a 3000 percent improvement!" Kudek adds, "When Excello Corporation operated out of these buildings it was extremely costly. Not only are we saving money, but people appreciate it (the improvement)."

When asked if workers were trained to conserve energy, Kudek noted that they are "educating folks by showing them how much it costs (to heat the buildings). We are moving toward a profit sharing approach ... where the operations are to be owned 40 percent by employees. When they read the profit and loss statements they will see how much energy use is costing us." Kudek concludess that this will be incentive to continue their laudable efforts in achieving energy efficiency.



Low Cost, Energy Efficient Cooling *Beats the Heat*

by Robert Tinker

In Michigan's temperate climate cooling and the energy required to keep cool are not often topics of concern. However the last two summers in the Great Lakes area, have been noticeably warmer than usual, and this year's drought has brought cooling issues to the fore. If scientists are correct about the "greenhouse effect's" warming of the earth's atmosphere, we in Michigan can expect more hot summers.

Most office buildings in Michigan, especially older ones, do not have air-conditioning. Keeping cool - or just being comfortable - in such buildings during extreme hot weather can be difficult. But before you go out and buy expensive air conditioning equipment, let's explore strategies for keeping cool that require less capital outlay and minimal energy. Those working in buildings with air-conditioning should consider the following methods for improving the efficiency of their equipment and reducing associated electrical costs without a decrease in comfort.

"There are three conditions which can be controlled to improve a non-airconditioned environment: temperature, air movement, and humidity."

First, a little physiology. The human body's primary means of cooling itself is through perspiration. This is the major advantage to being a relatively hairless mammal. Two parts of the human body which lose lots of heat are the head and feet. We cover these parts in winter in to stay warm--we should do the opposite to keep cool. Short hair cuts assist the loss of heat from the head; and sandals with light socks (or none) provide a cooling alternative. In general, clothing of natural fibers such as cotton allow skin to breathe best. Deodorants are fine; antiperspirants are not. In order for these more personal summer comfort strategies to work, an organization might consider relaxing its normal dress code during especially hot weather.

Another aspect of human physiology is that the body slows down when temperatures rise. People will be less productive. Expect a slower pace during hot spells. Many cultures in hot regions on the actually stop work during the warmest part of the day. This might not be practical in Michigan, but do consider scheduling earlier or later work hours during the warmest part of the summer or offering more flexible hours.

The last aspect of human physiology to consider is the need to replenish fluids. Keep cool drinks and ice available. Purified water is best.

Buildings Without Air Conditioning

For buildings without air conditioning there are three factors which can be controlled to improve the indoor summer environment: temperature, air movement, and humidity. The higher the temperature the harder the human body must work to keep cool. The greater the air movement over the skin the greater the effectiveness of perspiration as a cooling mechanism. Higher humidity means perspiration is less effective.

Temperature

There are several strategies that can be used to modify building temperatures including pre-cooling, controlling exterior heat gain, and controlling interior heat gain.

PRE-COOLING

A building can be pre-cooled each day by venting the building at night when temperatures are coolest. Open windows at sundown, or anytime when the exterior air temperature drops below the interior air temperature. This procedure will work especially well if the building is constructed of brick, concrete, or stone. These materials have 'thermal mass' which will store "coolth" (the opposite of warmth). Pre-cooling can be further augmented by the use of large window fans.

If this type of pre-cooling would not work in your facility, your forced air duct work (normally used for heat) can be modified to mechanically bring in cool air at night by running the blower. If you do not have a forced-air duct work system or if you cannot open your windows at night, you cannot take advantage of pre-cooling.

Once a building is pre-cooled, its interior temperature will be close to the lowest temperature reached that night. Then to keep the building cool during the day, it has to be closed up first thing in the morning (or as soon as outdoor temperatures rise above indoor temperatures). This assures that interior temperatures will rise more slowly than exterior temperatures (especially if insulation is adequate). The building should be kept closed all day or until interior temperatures exceed exterior temperatures. Use fans to increase comfort.

CONTROLLING EXTERIOR HEAT GAIN

After pre-cooling the next step is to control or delay the rise in temperature within the building. If insulation is adequate the exterior air temperature is not a significant factor in determining interior air temperature; the amount of direct solar radiation (sunshine) has more effect, especially if your building has a lot of windows.

The most effective way to shade windows from direct sun with trees. Trees and any other kinds of landscaping which provide shade are extremely effective in slowing the rise of interior temperatures. Shading roofs and west facing walls is especially important. Trees and other plantings will also help to cool air entering the building through windows and doors.

Beyond foliage, the best source of shade is exterior devices such as awnings, grills, and screens. The next best strategy is interior devices such as (by order of effectiveness): horizontal blinds, vertical blinds, shades, and curtains. Interior shading devices must be light colored to be most effec-

tive. Insulated window treatments such as quilts and shutters are also used but they tend to totally block out daylight. Direct sun is what you want to block, not diffused or reflected light.

CONTROLLING INTERIOR HEAT GAIN

After handling the problem of exterior sources of heat gain think about interior heat generating equipment. Lighting is often the most significant source. Where possible use natural light and use fewer lights, or install lower wattage bulbs (this will also lower your electricity bill).

Office equipment and appliances are usually the next most significant source of internal heat gain. Computers, typewriters, copiers, coffee makers, etc. should be *off* when not used.

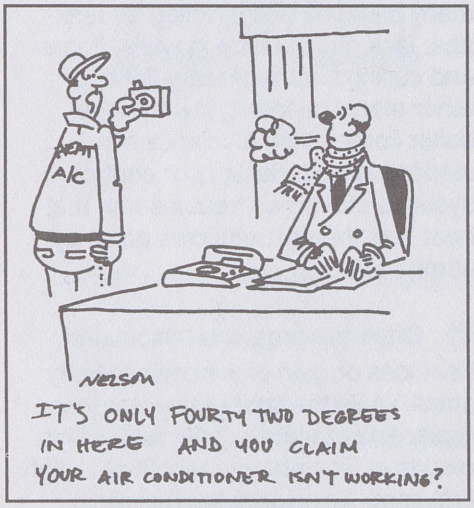
Last comes people; people generate heat. The more vigorous the activity the more heat produced. A slower paced work place is a cooler work place. Consider staggered work hours and judicious scheduling of vacation.

Air Movement

To increase air movement in buildings use windows and fans to create cross ventilation. On breezy days windows alone can be effective if the exterior air temperature and humidity are not too high. Attune yourself to the natural air patterns within your building. Experiment a bit, opening and closing various windows and doors. You may find that using natural forces makes your work space more comfortable than forced ventilation. However, when there is no outside breeze or if you do not have windows on at least two sides, cross ventilation may not be feasible.

When heat gets critical don't overlook the use of portable fans. They offer the most reliable and effective means of air movement. Incorporate their work potential into the natural air flow patterns you have discovered; don't try to use electricity against natural forces. If your goal is to create air movement, don't run fans in vacant spaces. The motors themselves generate heat and will overheat these spaces. If you are using fans for ventilation, have them set to exhaust air (and their own generated heat) *from* an occupied space instead of blowing outside air in. Though fans do use energy, it is far less than that used by an air conditioner, providing adequate comfort without creating an artificial environment. Fans make insufferable conditions tolerable, especially if you are in the path of the air flow.

When outside temperatures are warmer than indoor temperatures, window fans don't help unless the air is aimed *at you*. In a building without air conditioning everyone should have a fan, even if it is small.



Humidity

Humidity can be controlled without air conditioning by keeping the building closed when exterior air temperatures and humidity levels are higher than inside. However this only delays the rise in humidity. The only practical means of lowering humidity is with air-conditioning equipment or dehumidifiers. Dehumidifiers work on the same principles as air conditioners and must be used in a closed space to be effective. Dehumidifiers are often found in basements but could be used in a windowless office, where air-conditioning may not be practical. A dehumidifier is probably a last ditch effort to remedy a discomfort problem.

Buildings with Air Conditioning

The goal of a properly designed and maintained air-conditioning system is to provide adequate cooling with the lowest cost. Regular maintenance is essential. Filters in forced air systems must be cleaned or replaced; condensers (the part that releases heat to the outside) also need occasional cleaning; and refrigerant levels should be checked and recharged if necessary. Condensers should also be shaded from direct sun. This will keep the air surrounding the condenser cooler, enabling it to more efficiently transfer heat to the exterior. Air-conditioning controls and thermostats should be checked, and if necessary, recalibrated so that they read the correct interior temperature. The location of thermostats should also be assessed. Thermostats exposed to direct sun or in unoccupied rooms give improper readings to the air-conditioning system which then over or undercools building spaces.

In some buildings an air conditioning system may not provide adequate cooling. The equipment may not be sized to meet the load expected of it. Consider the options suggested for buildings without air conditioning before buying additional equipment.

In some buildings uneven cooling occurs with some rooms being too cold while others are too warm. In this case the delivery system may not be balanced. Unbalanced systems can be expensive to operate. However, balancing an air delivery system involves simply changing the positions of dampers in the duct work.

All air conditioning systems bring in outside air that must be cooled. Since the temperature of incoming exterior air is higher than the cooled interior air, a lot of energy is used. An efficient air conditioning system recirculates a large portion of the interior air. Of course fresh air is always needed, but the quantity should be limited to what is required for a healthful environment . Prohibiting smoking helps keep interior air clean and reduces the need for introducing and cooling exterior air.

Being comfortable at work in hot weather can be accomplished without more air conditioning but it takes cooperation. If your organization struggles with summer climate control, experiment with new cooling strategies and beat the heat...efficiently.

When Windows Conserve Energy...and When They Don't

by Rana Belshe and Tom Wilson

When it comes to cutting energy costs for building operations, a certain litany has developed over the years. "Caulk-Weatherstrip-Insulate-Boiler-Replacement-and-Storm-Windows" is a chant oft repeated in advertising circulars, government publications, and private thoughts. In commercial buildings, including many non-profit structures "New-Windows" is often added to the cadence.

All too often, when the scorecard of cost-to-energy-benefits is tallied, the payback period for window replacements may stretch 10, 20, 50 years or more.

While all these items can and do show impressive cost savings in some circumstances, all have associated caveats that limit either their effectiveness or "investment potential" as a cost cutting measure. If you read the advertising, it is easy to get the feeling that adding storm windows or replacing primary windows is the best energy-saving option. There are many salespeople ready to sell replacement window packages and they are an obvious building improvement. Depending on how bad the existing window units are, storm or replacement windows may indeed be an excellent energy saving tactic. All too often, though, when the scorecard of cost-to-energy-benefits is tallied, the payback period may stretch 10, 20, 50 years or more. This results in a pretty unsavory return on investment-something no organization can afford in these days of increasing demands on non-profit resources.

Why is this? How can it be that all these wonderful claims to cut heat loss in half, end maintenance for ever after, and add a swank new look to the neighborhood don't necessarily live up to their potential? Simply put there are three main reasons:

1) All buildings are complex in terms of energy flows, which are highly interactive; individual energy improvements must be evaluated based on their relationship to overall building energy performance. In many situtions uncontrolled air leakage, lack of insulation in walls, floors and ceilings, unnecessary lights or other electrical loads, low furnace/boiler combustion efficiencies or ineffective heat delivery or control systems can be so troublesome that heat loss through windows pales by comparison.

2) Often the area and associated heat loss or gain of windows is fairly small, while the cost of the storms or replacement units is quite high. This results in little energy benefit at a high first cost. For example, if each window is15 square feet and costs from $135.00 for a storm window to $400.00 for a double glazed window, to improve the R-Value from roughly R-1 to R-2 , it may not be such a good deal. Either fiberglass or cellulose insulation can improve the R-value of 15 square feet of uninsulated attic to R-38 at an approximate cost of $6.00.

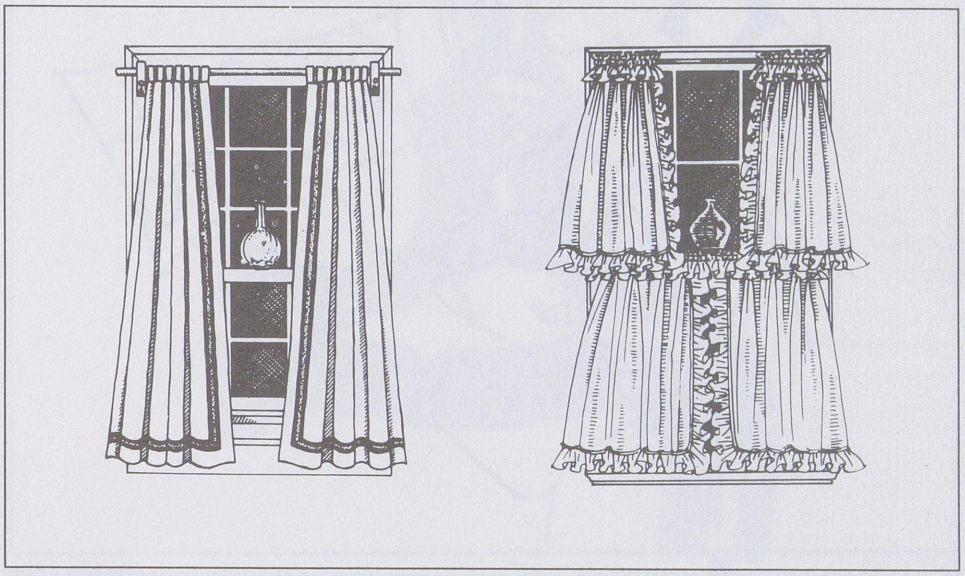
Tight-fitting interior storms are one solution-heat loss from windows since they then act as the primary window, stopping the initial air flow.

In this age of sophisticated advertising when everything is shown to its "best advantage", there are some technical facts that window manufacturers, salespeople and installers often fail to mention. One example: Even though a double-glazed "insulated" window may indeed cut heat loss (or gain in the summertime) by 50% through the glass, if the frame is made of highly conductive materials such as aluminum or steel, the overall heat transmission of the unit may be seriously compromised by the vast quantities of heat doing an "end run" around the frame.

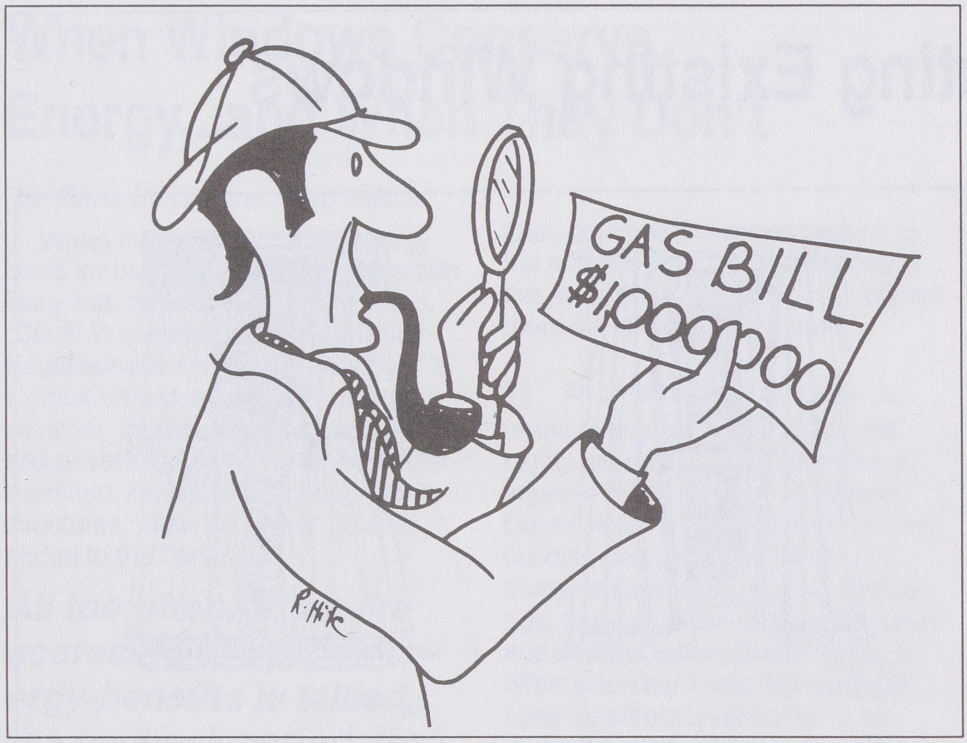
In order for an exterior storm window to have that extra R-value of protection, the window must be reasonably air-tight itself. If this is not the case, air currents escaping around the primary window can negate most of the benefit of the added pane of glass since the R-value and potential savings is dependent on an assumed "dead air" * space for much of its thermal benefit. Tight-fitting interior storms are one solution to this problem since they then act as the primary window, stopping the initial air flow. In all cases, it is important to keep emergency egress in mind since many of the plastics used in interior storm windows are very strong and removal may be difficult in case of emergencies.

Tips for Evaluating Existing Windows

Before investing the big bucks in new windows, you may wish to evaluate the condition and performance of your existing windows and develop strategies to upgrade them accordingly. Here is a checklist of potential problems and considerations to be used by maintenance or building management personnel or specialists:



- Is any glass missing or cracked?
- Is the putty in good condition?
- Does leaded glass need recementing? Repair?
- Are sashes solid?
- Is the jamb/sill square and solid?
- Are sash weight ropes or balances operable?
- Are sashes painted shut? Are they in a not-fully-closed position?
- Do beads of paint or debris keep window from sealing against stops and meeting rails?
- Are stops tight against sash?
- Do sash locks work properly? Are they closed?
- Is weatherstripping called for? Which kind, where?
- Are primary windows double glazed?
- Do metal frames conduct heat to the outside?
- Should the windows be replaced?
- Should all windows have storms? Do they?
- Are there storm sashes in storage in garage or basement?
- Do storm sashes need repair, reglazing?
- Is storm window hardware operable?
- Do storm windows operate properly?
- Is the outer storm sash on top or are the sashes reversed?
- Are storm windows properly caulked?
- Are there weep holes at the bottom of the storms? Are they open?
- Does moisture condense on primary windows? On the storms?
- Can interior storm windows be added?
- Are curtains of insulating quality? Are they sealed at top and sides? At the bottom?
- Are roll down shades used or just left at the half-mast position?
- Do windows present cold surfaces creating discomfort for people who must sit next to them?
- Can insulating shutters, shades, or curtains be added? Would they be used?
- Is window-mount air conditioner sealed tightly to the window unit?
- Is window-mount air conditioner unit removed in winter? Covered on the interior or exterior?
- Can a bathroom window be opened to provide ventilation?
- Can some top sashes be opened for effective summer ventilation?
- Must all windows be operable or can some be sealed shut? Has escape in case of fire been considered?
- Can any windows be closed off or removed, especially on the north side?
- Do important windows face south and therefore offer free heat in terms of winter gains?
- Can glass be added on the south side?
- Does unwanted heat from the sun - particularly in east and west-facing windows make summer work days unbearable? Can these windows be shaded? Can sun screens of films be added?
- How large an area do windows represent in the overall building heat loss/heat gain profile?
- Do windows add helpful daylighting to a work area? Would reflective venetian blinds make for more even distribution of daylighting?



Robin Hite

We know why we should save energy...or do we?

Since our most recent energy crisis began in the l970's (previous to the oil embargo were the energy shortages experieced during World War II), our awareness of energy issues has risen. We have implemented energy conservation measures at work and at home. Although energy conservation is not the issue it was several years ago, we are still consuming far more energy than we need, and far more than the Earth's supply of fossil fuels can continue to provide. Why else should we continue our efforts to save energy?

Cost

Detroit Edison's electricity rates are expected to increase by 15 percent or more over the next 3 years, while MichCon's gas rates are expected to stabilize over the next year or two and then begin climbing slowly. For nonprofits, higher energy costs often mean cutting back services, foregoing maintenance, and increasing fees. Energy conservation provides the opportunity to control energy costs and increase cash flow.

Immediate Benefits

Energy conservation measures pay for themselves by reducing utility costs; many low cost conservation measures save more than their original construction cost within a year or two.

Comfort

Energy conservation does not mean sacrificing comfort. In fact, energy efficient improvements will enhance the comfort level of a building.

Resources

Most of the energy we use is derived by burning fossil fuels such as natural gas, coal, and oil. These are the products of biological and geological processes modified over millions of years. Fossil fuels are, therefore, not renewable. In this century we are using up these resources at a phenomenal rate. By the end of the 21st Century coal is the only fuel that will still be relatively abundant. Energy conservation alone will not eliminate our dependence on fossil fuels. However, conscientious consumption will allow the earth's limited energy resource base to be stretched further.

Environment

The processes used to convert fossil fuels to energy contribute to smog, acid rain, the greenhouse effect and other environmental concerns. The production of energy not only affects the disappearance of natural resources but also has a profound effect on public health. Energy conservation limits the amount of nonrenewable energy we use and buys us time to research safer, environmentally sound, and renewable energy alternatives.

Wise Words About Water

by Aileen Gow

Until this year Michigan residents have had the luxury of an abundant fresh water supply; conserving water has not seemed necessary. But this year we experienced a drought in the Water Wonderland, and many communities had to restrict water use.

A water shortage, however, is not the only time to conserve. Even during years of normal precipitation, only one percent of the world's water is actually available for our use. The good news is that water conservation need not be inconvenient. By practicing water conservation we can help prevent the threat of local surface water contamination. You can also save money, energy, and of course, water.

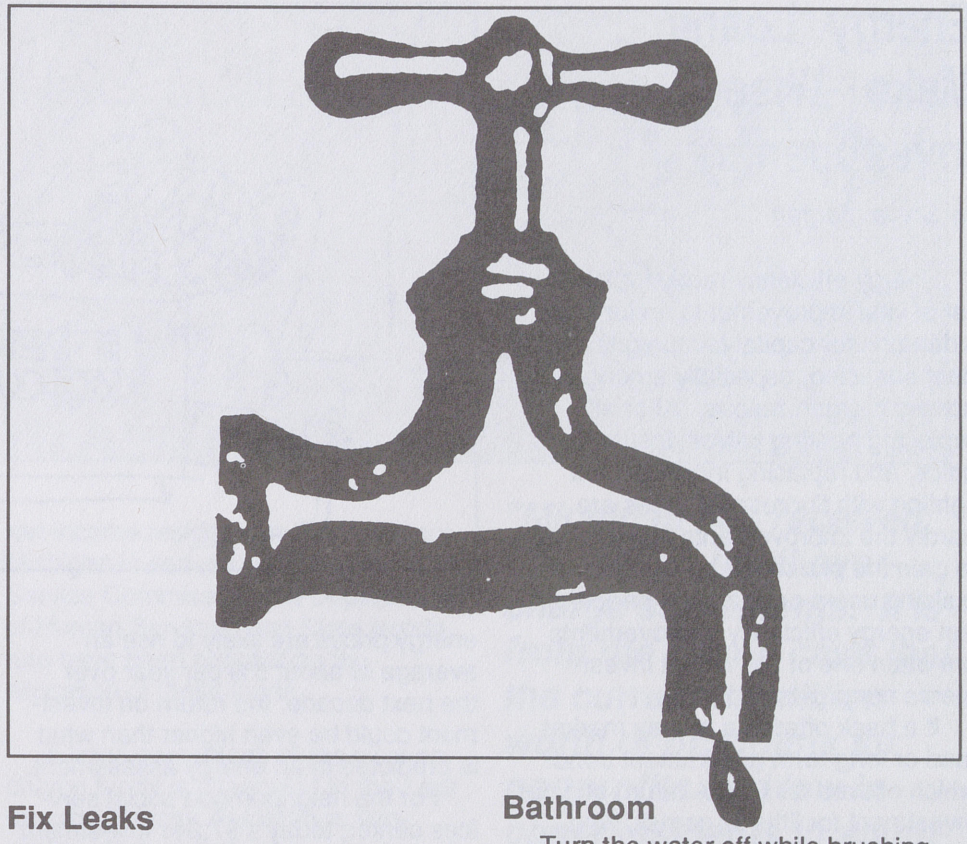
Cost and Energy

Saving water helps to lower *all* of your utility bills. Gas and electricity consumption is reduced as hot water use is cut back. If you use city water, you pay for the amount of water that you use plus costs for sewer service. Each person uses an average of 30,000 gallons of water per year at an annual cost of nearly $100. If you use a septic system, conserving water extends the life of the system and delays the need for repair. Replacing a septic system can cost up to $4,000.

Pollution

Overburdened, old, or leaky septic tanks can contaminate nearby lakes and streams. City sewer systems that are overloaded can cause untreated sewage to flow to lakes and rivers. The smaller the amount of water flowing through these systems, the lower the chance of pollution occurring.

The following list of water saving techniques can be applied to water use at home and at work:



Fix Leaks

Check faucets for leaks. Nearly 2 gallons can be wasted per day by dripping faucets. The most common leak is caused by a faulty washer which can be replaced for a few cents. A running toilet can waste 4 gallons per hour. Keep plumbing in good repair.

Toilets

Don't use the toilet as a waste basket. A typical flush takes 5 to 8 gallons of water. Putting toilet dams or water filled plastic jugs in the tank can reduce toilet water flow by as much as 25%. Another way to substantially reduce water use is by installing a low flow toilet, which uses only 1.5 gallons per flush.

Faucets

Installing flow restrictors or aerators in faucets and showerheads can reduce water use by 40 to 60%. An aerator mixes air with water, thereby producing a more powerful flow using less water.

Bathroom

Turn the water off while brushing teeth, shaving, etc. Leaving the water running wastes 3-5 gallons every 2 minutes. Take showers instead of baths. The average bath uses 36 gallons while a 3-minute shower takes 25 gallons.

Kitchen and Laundry

Running tap water until it's cold easily wastes a gallon of water. Keep a jug of water in the refrigerator. Washing dishes with the water running can use 30 gallons per meal. Put a stopper in the sink or use a dishpan when washing dishes. Run dishwashers and clothes washers only when full. A single dishwasher cycle uses as much as 50 gallons of water.

Outdoors

Water lawns and gardens sparingly. (Believe it or not, a brown lawn is not dead—only dormant. It will grow when rain and cooler weather return.) The most efficient time to sprinkle is in the early morning or early evening. Use mulch around trees, shrubs and in garden beds. This reduces the amount of moisture lost through evaporation.

Energy Loans Make Wise Investments

by Steve Morgan

Robin Hite

Energy efficiency rarely tops the list of vital improvements under consideration for capital campaigns or debt financing, especially among nonprofit organizations. After all, replacing heating valves, insulating attics, and replacing incandescent lighting with fluorescent tubes are hardly the improvements that are apt to gain the praiseworthy attention of building users or boards of directors. Yet energy efficiency improvements are often one of the wisest investments nonprofits can make.

If a bank offered a money market fund or long-term government bond which offered a 15-20% return on your investment for little or no risk, who would not be interested in taking it? That kind of return would even justify borrowing money at 10-12% in order to generate a 3-10% net return on the money. An energy efficiency investment frequently offers rates of return in excess of 20%. A recent energy assessment completed on a neighborhood social service center in an eastern city revealed exactly this type of opportunity. The net return on their investment, based on $7,241 worth of installments, is estimated at 21.6% - a better return than any financial instrument can promise.

Of course, there is no guarantee that the neighborhood center's investment in fluorescent lighting, a new oil burner, double glazed windows, a new heating valve, and related improvements will generate these returns. However, many nonprofit organizations which have made similar investments have met or surpassed the engineering estimates for savings. But even if estimates are too optimistic, the rate of return will still at least exceed 15%. And that rate of return should be generated for up to fifteen years if appropriate operations and maintenance systems are put into place. In fact, given that energy prices are likely to rise an average of about 5% per year over the next decade, the return on investment could be even higher than what is predicted in an energy assessment.

For the neighborhood social services center, today's $7,241 investment in energy efficiency is expected to yield $18,846 in net savings over the anticipated 15-year life of the installations. What other investment compares with this opportunity? The agency will then have about $18,000 more to spend on services or needs central to its mission. Even if these improvements were financed with a 10% loan over 5 years, the net savings over fifteen years would still exceed $16,000.

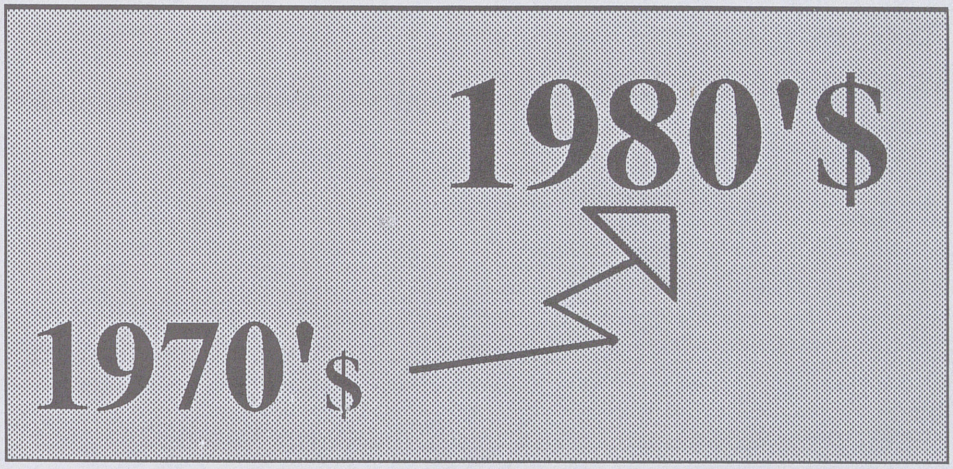
"But why a loan? Why not a grant?" The first instinct of a nonprofit organization confronted with a major renovation or unanticipated expense is to launch a capital drive or apply for a grant. This may make sense for a building addition, purchase or major renovation. Renovations may not be able to pay for themselves in added income, so raising additional capital from outside sources is a logical move. But energy efficiency improvements are investments yielding substantial dividends, a much different proposition than most capital improvements.

An investment deferred for months or years may be dividends lost and net savings foregone—even if grants and contributions eventually do materialize. For example, if the neighborhood center raised $3,000 in grants and contributions two years after it had identified its savings opportunities, it would have meanwhile forfeited $3,000 in savings which a loan could have generated over the two-year period (although debt service costs must be subtracted from this amount annually for the life of the loan). Once the loan is paid off, the agency enjoys a windfall in energy savings.

Grants and contributions from individual donors and foundations are easier to obtain for building additions, purchases or renovations than they are for energy efficiency investments. To the extent that grants are secured for energy improvements, donations will not be available for other needed capital improvements. When energy improvements can pay for themselves so quickly, and these types of grants are so scarce anyway, nonprofit organizations can more readily benefit by financing the improvements today with debt financing. If budget savings, capital campaigns, or grant writing efforts do succeed one or two years later, the agency can then pay off the loan early or undertake another capital improvement.

Energy efficiency improvements may rarely top the list of vital improvements under consideration for capital campaigns – but given the potential for loan financing, maybe they should.

Oil Overcharges of the 1970's Deliver $avings for the 1980's



by Steve Morgan

During the early seventies the Nixon Administration tightened control over the oil market to prevent price gauging and runaway profits. Some oil companies did not adhere to price regulations, and eventually billions of dollars in overcharges were detected. After years of litigation, a series of federal court decisions have remanded more than three billion dollars to state governments in an attempt to compensate consumers who were overcharged fifteen years ago.

Federal courts, at the urging of the United States Department of Energy (DOE), attached strings to the refunded money in a series of decisions beginning in 1983 and extending to 1987. Arguing that it was impractical and unwieldy to rebate individual consumers fifteen years later for overcharges on heating oil and gasoline, the courts ordered that in expending the oil overcharge funds, states must follow guidelines for five existing categories of federal energy conservation programs. These programs, which are described below, included two programs for low income residents, a program serving schools and hospitals, and two programs for which other residents and small commercial customers would be eligible.

Michigan has received $71 million from the largest of these settlements, the Exxon case. Another major settlement, Stripper Well, has returned $34 million to the State, with several million more to be paid over the next three years. It is from the Exxon case that the current $3 million worth of programs for nonprofits and low income residents in Southeastern Michigan is derived. The Public Service Commission, the Department of Human Services, and State legislature have been negotiating the allocation of these funds.

A large percentage of the oil overcharge funds is channeled to the **Low Income Energy Assistance Program**, which directly pays a portion of the heat bills of low income households. Oil overcharge monies also fund the **Weatherization Assistance Program**, which provides grants averaging $1500 per household for weatherization of low income homes and rental units.

The **Institutional Conservation Program** provides funding for technical energy studies and matching grants for installation of conservation measures in schools and hospitals. This program serves the largest nonprofit buildings, although funding levels are limited.

The **State Energy Conservation Program (SECP)** and the **Energy Extension Service (EES)** are the two remaining program categories which have a more general mandate, focusing on the residential and small commercial sectors. Both of these programs enable the creation of nonprofit energy conservation programs. Although the direct purchase of energy conservation materials or other hardware is prohibited within these categories, program management, marketing, energy surveys and education are important program components. Under these programs funds may also be used to ease the interest rates of conventional loans for energy efficiency improvements.

"Michigan has received $71 million in oil overcharge settlements. It is from the Exxon case that the current $3 million worth of programs for nonprofits and low income residents in southeastern Michigan is derived."

Thus, when complimented with local match funding to cover direct purchases of energy conservation materials, these last two program categories can stimulate energy efficiency projects in smaller nonprofit buildings - social service agencies, recreation buildings, museums, child care centers, etc. It is not surprising that these types of facilities are among the least energy efficient in the commercial building sector. But even though such organizations stand to gain the most from energy conservation, until now they have not benefitted from federal or state energy programs. Here at last is the opportunity to cash in on the energy crisis of the seventies and to take more control over energy costs in the nineties.

Other Energy Programs

SENIOR CENTER GRANTS

The *Office of Services to the Aging* is offering grants of up to $50,000 for equipment, materials and installation of energy efficiency building modifications to Senior Centers. The building modifications must have a payback period of ten years or less. Competitive bid costs for the building improvements will be used to determine payback. Energy cost savings are estimated by utility companies offering energy analyses through the *Michigan Business Energy Efficiency Program (MBEEP*). While the MBEEP analysis can be paid for with grant funds, some utility companies are providing this service free of charge. For more information or to obtain a Request For Proposal, contact Holliace Spencer at (517) 373-9365.

COMMUNITY ENERGY MANAGEMENT GRANTS

The *Michigan Department of Commerce's Office of Energy Programs/Public Service Commission (OEP/PSC)* will be distributing Requests For Proposals for Community Energy Management (CEM) grants. Community agencies and local governments which have never before received a CEM grant are eligible and encouraged to apply. Grant award decisions will be based on such factors as: likelihood of success; extent of local support; strength of utility company and community participation; and matching local resources. A variety of specifically designed demonstration projects will be funded. To be placed on the mailing list for RFP's or for other information, such as the annual CEM Conference and quarterly newsletter, call *(517) 334-6252.*

SCHOOL AND HOSPITAL ENERGY GRANTS

Two types of matching grants are administered by the *U.S. Department of Energy* grant program for public and nonprofit schools, colleges, universities and hospitals. Technical Assistance grants provide funding for detailed engineering studies which help identify and evaluate energy conservation measures. Energy Conservation Measure grants fund the design, purchase, and installation of energy conserving equipment and supplies.

The *Office of Energy Programs of the Michigan Public Service Commission OEP/PSC)* reviews and recommends applications to the Department of Energy for funding on an annual basis. Further information can be obtained by calling OEP/PSC at **(517) 373-7543**.

NONPROFIT ENERGY WORKSHOP SCHEDULE '88

For registration information call Nonprofit Energy Works at (313) 747-7904.

SEPTEMBER 30 (8-12:30pm)
Washtenaw Community College, located at 4800 E. Huron River Drive between Hogback Road, Clark Road, and E. Huron River Drive.

OCTOBER 12
UAW Hall Region 1-B, 711 W. Thirteen Mile at I-75 in Madison Heights.

OCTOBER 19
UAW Hall in the David Miller Building, 8731 East Jefferson in Detroit.

NOVEMBER 2
Goodwill Industries of St. Clair County, 1013 - 26th St. in Port Huron

NOVEMBER 16
UAW Hall Region 1, located at 12000 E. Twelve Mile Road in Warren.

DECEMBER 7
St. Mary's Academy Conference Center, located in Monroe at 502 West Elm Street between Monroe and Roessler Streets.

Nonprofit Energy Works
c/o The Ecology Center
417 Detroit Street
Ann Arbor, MI 48104

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