



Your Guide to Hands-On Home Weatherization

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Using this Booklet

Use the methods described in this booklet to install the products in the weatherization kit to reduce your energy usage. The kit contains products and tools that you can easily install to start saving energy today.

Si usted quisiera este documento en español, por favor visite la siguiente página web.
chicagoconservationcorps.org/blog/wp-content/uploads2/2010/09/Spanish-Guide.pdf

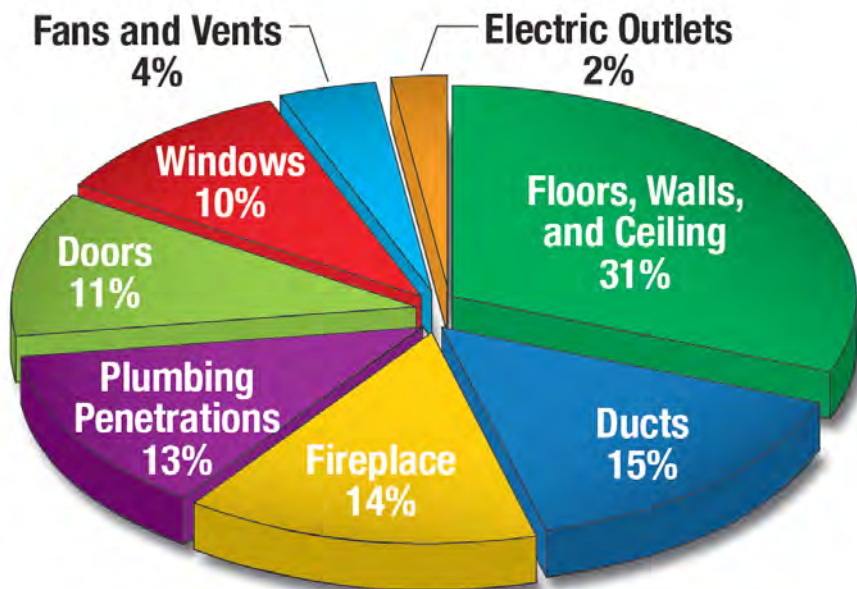
Let's look inside for hidden energy losses.

Imagine that your home is snugly wrapped in a blanket that protects you and your family while keeping the cold, winter weather outside. Perhaps there are some holes in this blanket where the cold air can sneak through – where warm air leaks out and cold air comes in. You can find these air leaks and close them to increase your comfort. This is what basic weatherization is all about. Sealing air leaks works the same way in the warm months – keeping out the unwanted heat while holding in cooler air.

You can find air leaks – large and small – by looking carefully at your apartment or home, then seal them using the products in your kit to seal the leaks. We'll show you sketches of some common air leak locations at doors, windows, and baseboards.

Sealing Air Leaks

Warm air leaking out of your home during the winter and into your home in the summer can waste a lot of energy and money. Some of the quickest dollar-saving tasks you can do are to caulk, seal, and weatherstrip all seams, cracks, and openings to the outside to save on your heating and cooling. The graph below shows the average home's air leakage broken down by location.



Average home air leakage by location

Artwork courtesy of U.S. Department of Energy, Energy Efficiency & Renewable Energy: http://www1.eere.energy.gov/consumer/tips/air_leaks.html.

Items in your weatherization kit

General rules: 1) prep site, 2) measure, 3) test fit the item, 4) cut, and 5) apply.

Preparation is very important. Look at the directions in the product packaging for specific guidance on each item. In general, though, be sure to clear away debris, wipe surfaces with a damp cloth, and let them dry before applying your products.

Rubber weatherseal/weatherstrip: durable edge seal for door and window openings

- The roll is made of two strips that need to be pulled apart into long strips. Gradually remove the adhesive backing as you press, sealing in place.

V-shaped seal/weatherstrip: another durable edge seal for doors or windows

- Fold the strip in half lengthwise. Gradually remove the backing paper while pressing the adhesive side to the door or window surface. If applying to wood, tack the adhesive side at each end with a small nail to keep it in place as you remove the backing paper, then sink the nails in for greater adhesion. Do not nail the two sides of the V-shaped seal together! The adhesive side is nailed and the other side is free to open and close by the door or window.

Window kit: plastic film and tape to cover windows and other large openings

- Entirely cover each window that will remain closed for the whole winter or longer. Film functions like an “indoor storm window.” Especially good for windows that are too difficult to weatherstrip, or for other large openings like storm doors and fireplaces.

Clear poly tape: for quick, temporary sealing needs

- Apply across window pane cracks. Protect your hands - cracked glass is sharp!

Caulk and caulk gun: seals small gaps; applies white and dries clear

- First, lay down newspaper or paper towels as a nearby resting spot for an open tube of caulk. Then, hold down the silver release on the plunger of the caulk gun and pull the plunger all the way back. Seat the tube of caulk in the caulk gun, then let go of the silver release. Next, prepare the tube of caulk: unscrew the nozzle, cut the tip off of the tube, screw the nozzle back on, then cut the end of the nozzle at about a 45-degree angle. This will create a hole approximately 1/8 inch in diameter. Apply the caulk by gently squeezing the handle. Press the silver release to stop the flow of caulk. Have paper towel or newspaper available to catch any overflow. Cover the tip of the nozzle with tape when you store the caulk for its next use. Clean up extra caulk with water.

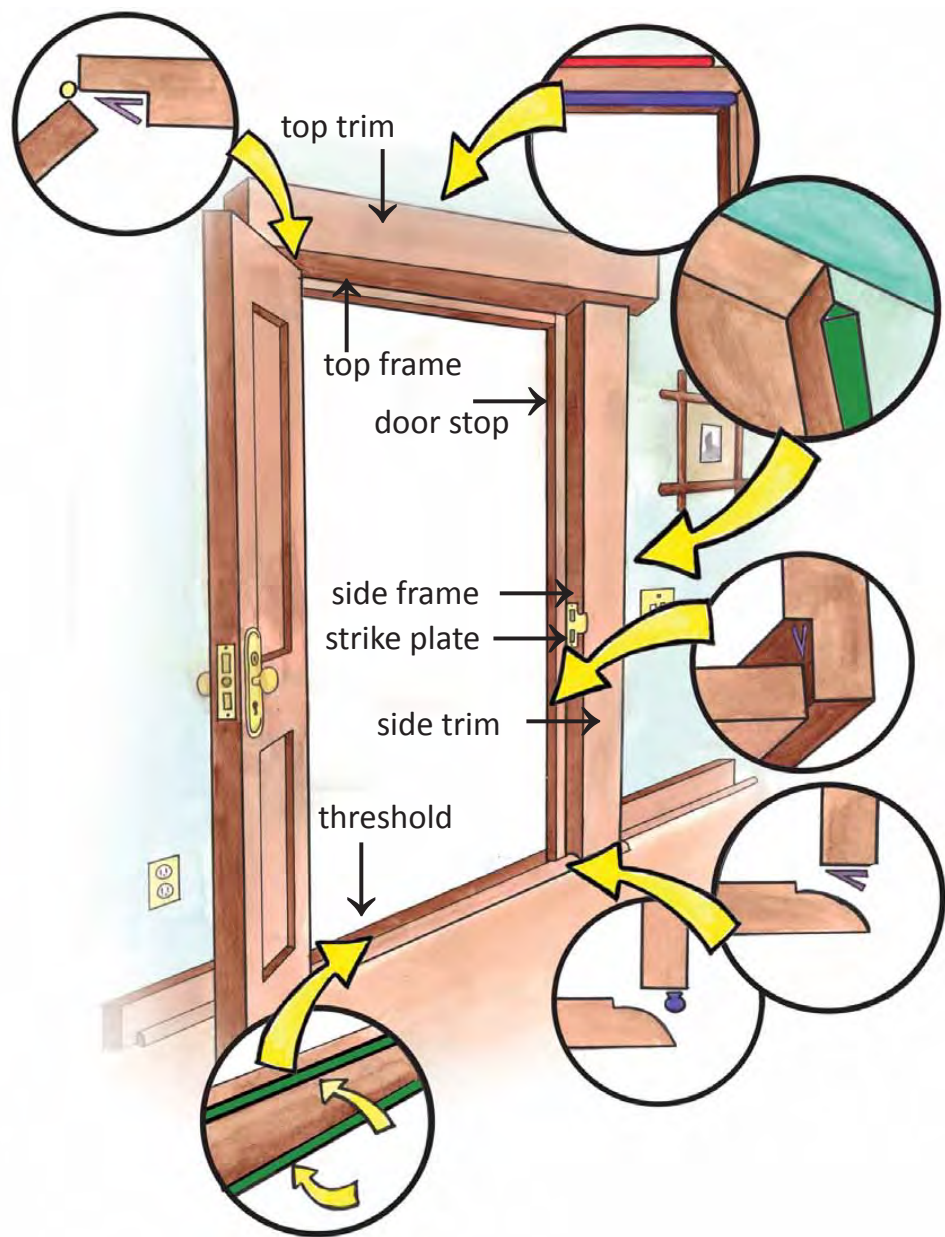
Foam rod: flexible foam rods for filling openings larger than 1/4 inch

- The foam rods are 3/8", 5/8" and 1" sizes. Push pieces of the foam rod into openings larger than 1/4". (These openings are too big to be filled by caulk alone.) If preferred for appearance, you can apply caulk over the rod.

Compact fluorescent light bulb (CFL): use in place of an incandescent bulb

Keep your work area safe.

Adult supervision is advised for installation of these items.



Start looking for leaks at your front door.

Your goal is to find openings around the edge of the door and decide which items in your kit work best to close each gap. To start, be sure that the door is hanging correctly. If necessary, tighten up the hinges, door knob, striker plate and parts of the door frame.

Stopping doorway air leaks

Using the diagram to the left, go around the door and frame and look closely for the following openings when the door is closed. Look between:

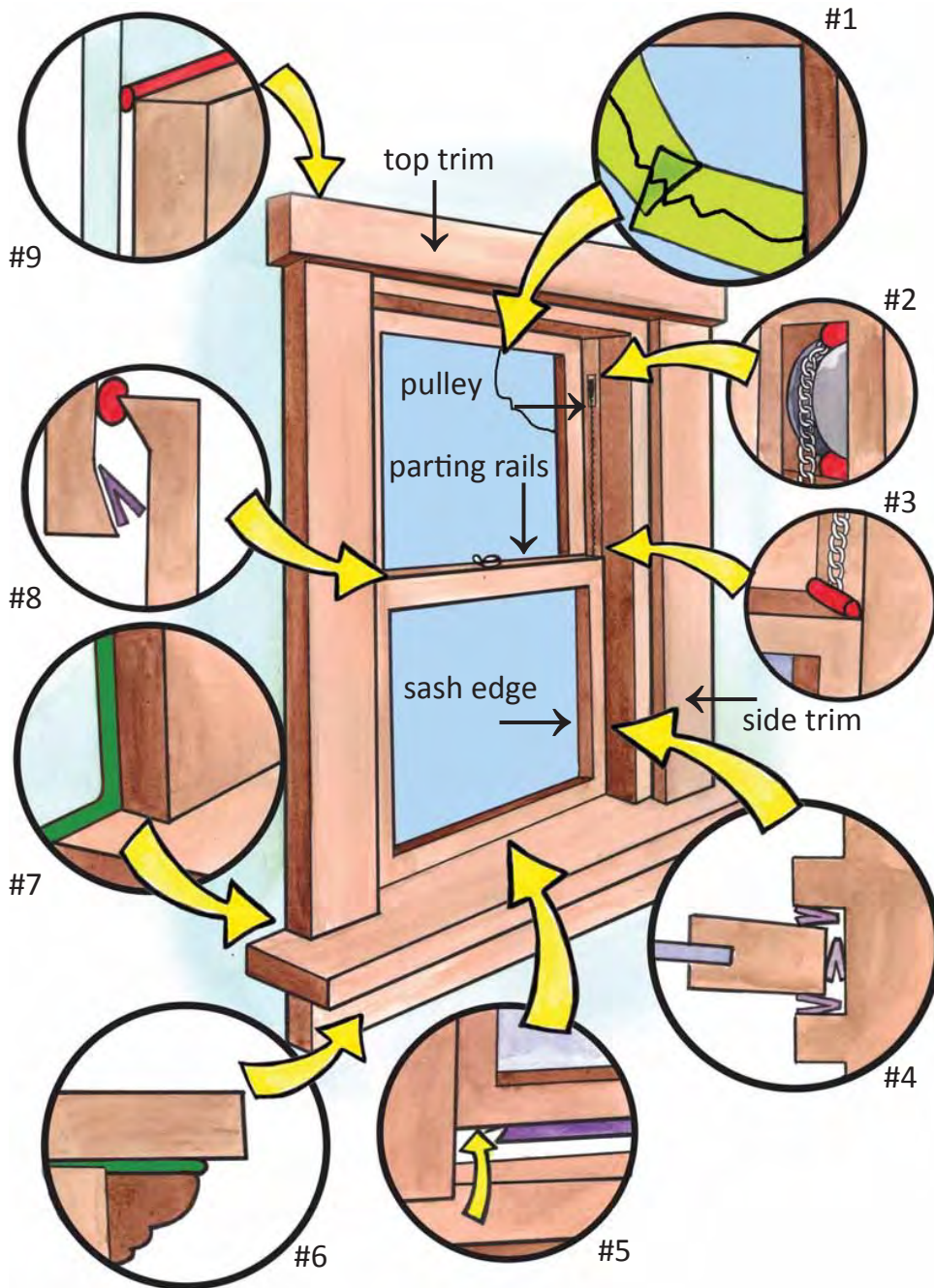
- the door and the frame – top and sides
 - the door and the door stop – top and sides
 - the top and side trim and the wall
 - the door and the threshold
 - the threshold and the floor
- Note: The hinge side, latch side, and top may fit differently.*

Now you can choose which of your supplies will work best in each case. Start by determining which item will plug the gap while still allowing the door to be easily opened and closed. Your choices from the kit (color-coded in the image to the left) are:

- rubber weatherseal
- caulk
- foam rod
- v-shaped weatherseal

Further information

For more information, including examples for other types of doors and how to apply these materials, visit the Community Weatherization Action Teams' website at: chicagoconservationcorps.org/blog/weatherization/



More air leaks hiding in plain sight – your windows!

Focusing on your windows

Windows come in all shapes and sizes. Small gaps, openings, slits, cracks and holes can sometimes be too numerous to count. Many gaps are necessary for windows to open and close – but some are energy wasters.

Many of the items in your kit (color-coded in the image to the left) are useful with windows:

- caulk
- foam rod
- window kit (not pictured)
- clear poly tape
- v-shaped weatherseal

Choose a window or set of windows in your home where you notice air leaks. Look at the diagram to the left. Now find the parts of your window(s) where there are gaps or openings. You might see the gaps or feel air coming in.

Here are ways you might use each of your kit items, along with a matching inset number that illustrates its use in the window diagram to the left.

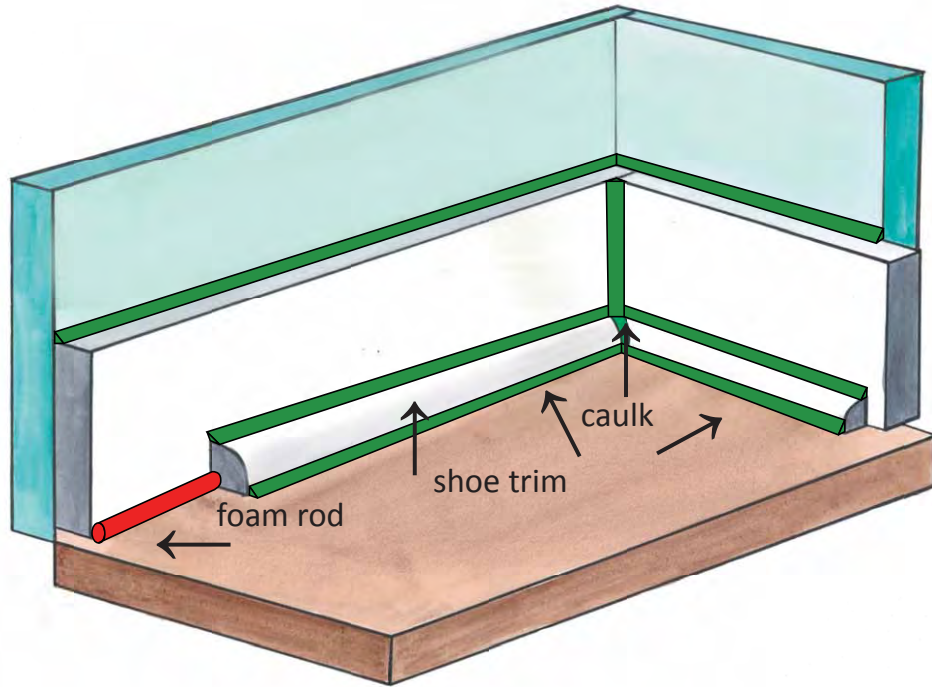
- clear poly tape on cracked glass (# 1)
- foam rod in the pulley holes and openings of window sash, corner and frame (# 2 and # 3)
- V-shaped weatherstrip along sash edges (# 4 and # 5)
- caulk between window trim and wall (# 6 and # 7)
- V-shaped weatherstrip between parting rails (and foam rod when window is open for an air conditioner) (# 8)
- foam rod and/or caulk between top trim and finished wall (# 9)

You can decide which product best applies to your situation. As always, prepare and clean surfaces first.

Window kits function like interior storm windows once they are installed. They can also be applied to other energy wasters like fireplace openings (unused), whole house fans (unused during the winter), skylight wells, and seldom used attic or kneewall access hatches. Measure the windows or other openings carefully and plan before you cut the plastic film. Each piece of film is big enough to cover several windows.

Further information

Find videos and fact sheets on working with windows and installing the window kits on the Community Weatherization Action Teams’ website, chicagoconservationcorps.org/blog/weatherization/



Find the Gaps

The diagram at the left is a typical baseboard. The space where the wall meets the floor is usually covered by a base and shoe trim. Air from outdoors may leak in here, and you can stop leakage by sealing. Expect severe leakage where the shoe trim is missing. Check the carpet edge, under baseboard heaters, behind radiators, and peek under and behind kitchen and other built-in cabinets. Check closets, utility rooms, and other out-of-the way spots at exterior walls.

Preparation

- brush away dust and debris
- remove remaining dust with a moist rag
- allow area to dry
- cover floor with newspaper

Pull the trigger of the caulk gun to start the caulk flowing. Use the silver release to stop flow. Practice caulking in a closet, laundry, or utility room. Comfortable and safe body position is important. Pad your knees when sealing at floor base.

Application

Fill gaps wider than ¼” with foam rod before applying caulk. Start at a corner and run a continuous bead at a steady pace for as long as possible before stopping and starting. Adhere caulk to both sides of the gap. “Tool” the caulk - it’s OK to run your finger over the bead to adhere the material and smooth the surface, just wet your finger first. Clean mistakes using a damp rag. For the neatest appearance, apply masking tape to the floor before starting to caulk. Apply the tape in a straight line ½” away from the shoe trim and remove the tape after the caulk is tooled and beginning to harden.

Instead of caulking at the shoe trim, you may hide your air sealing work by loosening the shoe trim, sealing between the floor and base trim, and then reinstalling the shoe. Caulk smaller gaps first, then cut the caulk gun nozzle larger (i.e., lower on the tip) before filling larger gaps. If you do not use the full tube of caulk, be sure to cap the end with tape to prevent the unused caulk from drying out before next use.

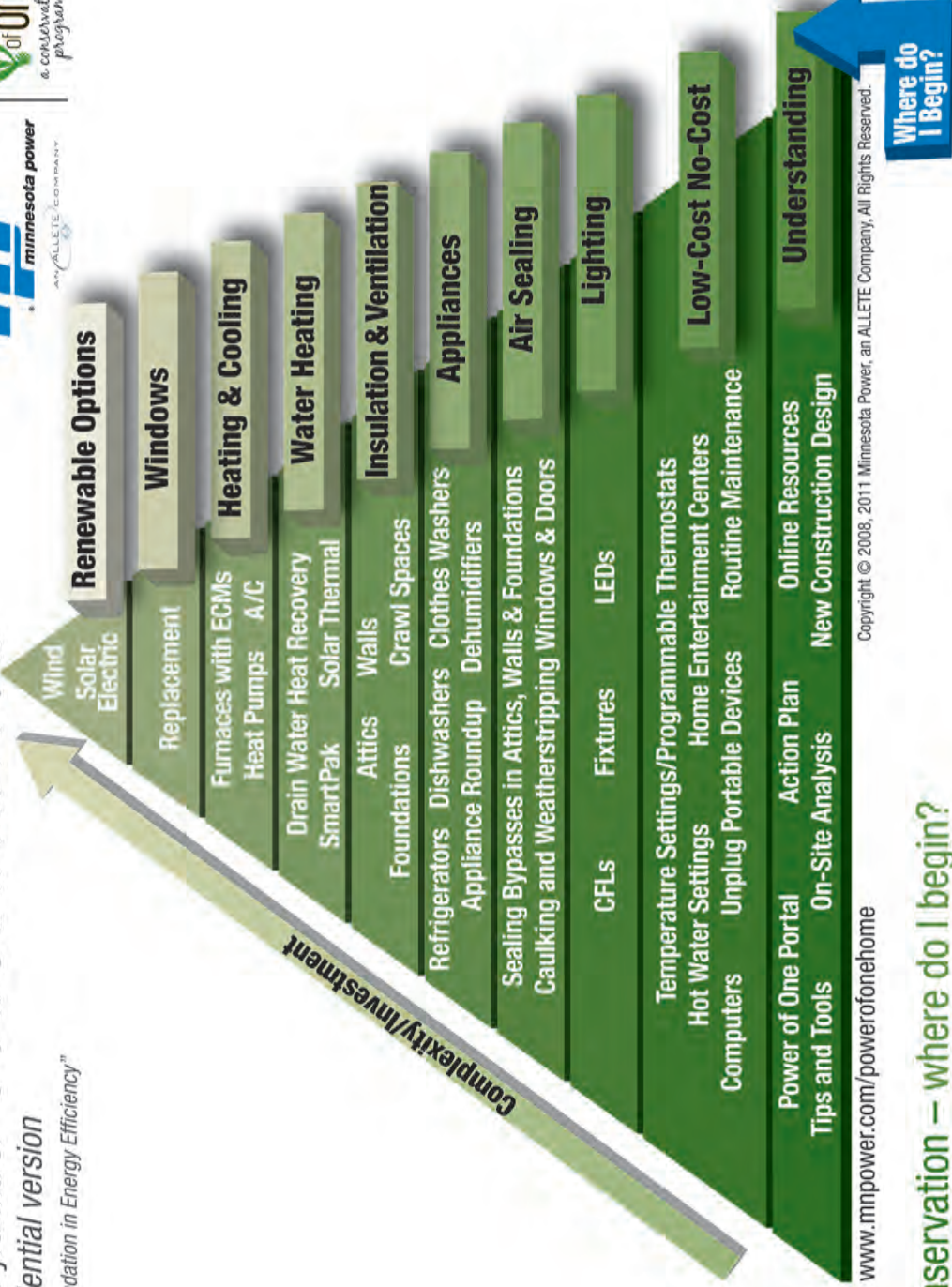
Learn more

You can find out much more about the do’s and don’ts of stopping air leakage on the Community Weatherization Action Teams’ website, chicagoconservationcorps.org/blog/weatherization/

The Pyramid of CONSERVATION

residential version

"A Foundation in Energy Efficiency"



www.mnpower.com/powerofonehome

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Conservation – where do I begin?

The choice to be more energy efficient may be clear, but the starting point can be more difficult to determine. The Pyramid of Conservation is designed to help you prioritize steps and develop an action plan that's right for you. By establishing a foundation in energy efficiency and gaining a better understanding about how you use energy, you can more effectively work your way up the pyramid.

This Pyramid of Conservation was designed by the electric company Minnesota Power to help homeowners prioritize steps and develop an action plan for reducing energy use in their homes. Although the focus is electricity savings, the pyramid applies to all energy use.

At the base of the pyramid are higher priority items, determined by cost and effectiveness. The amount of money needed for investment rises as you go up the pyramid. Above that tier is renewable energy. Each home or apartment is unique, but the Pyramid of Conservation is a good general guide.

Climbing the Pyramid

Start at the base of the pyramid. Energy conservation and understanding are the first steps. Actions listed here are of two types: behavioral and educational. Behavior—what you do or don't do -- can be as simple as turning down the thermostat and turning off computers, ceiling fans, and lights as you leave a room. Education changes involve creating an action plan for energy efficiency via a professional energy audit.

Next, going up the pyramid, are the energy efficiency actions. Improving the efficiency of your home or apartment means you use less energy without sacrificing comfort. You can take some steps right now with products in your weatherization kit. You can take further steps by purchasing Energy Star appliances when you need replacements. The biggest step will be putting your action plan into practice. This will likely involve air sealing, insulation, replacing old heating equipment and other measures to improve your home's efficiency.

At the top of the pyramid are the renewable energy choices. Harvest energy directly from the sun, wind or other renewable sources. Remember that any energy saved is "zero carbon," just like renewable energy.

Building on a Solid Foundation

It's logical. By climbing the steps from the bottom up, you begin with the most cost-effective measures first and take the savings with you as you climb. The higher you go on the pyramid, the higher the cost and the longer they payback.

Where do I Begin?

Compact fluorescent light bulbs (CFLs)

They won't stop air leaks in your home, but they can reduce your electric bill. CFLs are energy-efficient light bulbs. They fit in light fixtures that currently accept screw-base incandescent bulbs. CFLs are now sold in a wide variety of shapes, intensities, and light colors. You can even get CFLs for your dimmable fixtures, and CFLs covered in round glass globes so they look like incandescent bulbs.

Why use CFLs?

CFLs use 75% less energy than incandescents and one CFL lasts about as long as 10 incandescent bulbs. Each bulb may save you as much as \$45 over its life because it saves by using less energy AND by saving you from replacing ten incandescent bulbs.

What else is different about CFLs?

CFLs contain a very small amount of mercury, so it is important to dispose of your used CFLs properly. You can recycle burned out CFLs at your local hardware store (ACE, Lowe's, Home Depot, etc.). You can also make use of the Household Chemicals and Computer Recycling Facility (HCCRF) located at 1150 N. North Branch during their regular business hours (Tuesdays, 7 a.m.-12 p.m.; Thursday, 2 -7 p.m.; first Saturday of every month, 8 a.m.-3 p.m.).

What should I do if I break a CFL?

Carefully sweep the broken CFL pieces and dust into a plastic bag, being careful to avoid inhaling any residue. Wipe the area down with a damp disposable cloth and put the cloth into the bag. Bring the bag to HCCRF if possible (see above), or throw it in the trash.

Special thanks to Commonwealth Edison for donating the CFL included in your weatherization kit.



Home Energy Quiz

Take a few minutes to mark true or false next to each statement.

- | True | False | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Setting the thermostat too low in winter when I leave the house will cancel out my energy savings because of the extra energy required to bring the room's temperature back to a comfortable level later. |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Turning lights on/off causes an electric surge that will cancel out energy savings from turning the lights off. |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. It is better to use an appliance until it fails, rather than purchase a more efficient appliance before the old one fails. |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. A ceiling fan cools air in the house, so I should leave it on when I am not at home. |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Windows and doors are the primary source of air leakage in homes and apartments. |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Replacing windows gives me the greatest energy savings per dollar spent. |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. More attic ventilation is better. It prevents mold in the attic and cools living space in summer. |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. Duct leakage in attics, vented crawl spaces, or attached garages is a rare problem of minor consequence. |

Answers are on page 18

Further information

You can find more information about energy efficient lighting and proper disposal of CFLs in the additional brochures included in this kit or by visiting www.cityofchicago.org and searching "CFL".

Where can I find more information?

A wide variety of videos, fact sheets, guides, do-it-yourself tips, product reviews and financing help can be found on the Community Weatherization Action Teams' website at chicagoconservationcorps.org/blog/weatherization/.

- Many books about weatherization and cutting energy costs are available through the Chicago Public Library.
- ComEd's Smart Ideas® programs feature a good mix of weatherization guidance online: https://www.comed.com/pages/promo_smartideas.aspx.
- Energy Star describes numerous weatherization practices and where you can locate qualified materials to make your home as energy efficient as possible. www.energystar.gov/index.cfm?c=home_improvement.hm_improvement_index
- The Chicago Center for Green Technology (CCGT) and its Green Tech U offer many seminars, workshops and field trips on these and related topics. Most are free of charge. CCGT, part of the City of Chicago Department of Environment, is open Monday – Saturday at 445 N. Sacramento Blvd. Visit www.cityofchicago.org and search "Green Tech U".
- Home Energy Saver, the U.S. Department of Environment's free on-line energy audit: <http://hes.lbl.gov/consumer/>
- U.S. Department of Environment, Energy Efficiency & Renewable Energy: <http://www.eere.energy.gov/>
- Energy Star's Home Energy Yardstick allows you to compare your household's energy use to others across the country and get recommendations for improvements: <http://ow.ly/2zivW>
- Energy Impact Illinois is helping residents, businesses, and non-profits reduce energy use by providing simplified access to energy efficiency information, financial mechanisms, and workforce resources. This is a partnership between Chicago Metropolitan Agency for Planning, City of Chicago, City of Rockford, gas and electric utilities, and other stakeholders. See <http://www.energyimpactillinois.org> for more information.

Can I implement these weatherization measures by myself?

Yes. The items in this kit can be easily installed using only scissors, a knife, and a hammer. You can increase your savings by applying these measures all around your home. You can purchase more of these inexpensive products at a local hardware store or you can order them online.

Will I need to weatherize every year?

Depending on patterns of use and wear, some of the products in your kit will last for years. Others may need to be replaced annually.

What else can I do?

You can also pursue more permanent measures for increased savings. These include:

- Getting a professional energy audit that will provide recommendations for energy efficiency improvements for your home.
- Sealing air leaks at attic floors, basements and crawl spaces.
- Adding insulation to attics, walls and basements where needed (only after thorough air sealing).
- Making sure the heat gets from your furnace or boiler to your rooms (an average 10% of heat is wasted by escaping outdoors).
- Upgrading your space heating equipment to a unit with a 95% efficiency or higher.

Where can families with limited incomes find help to weatherize their homes more permanently?

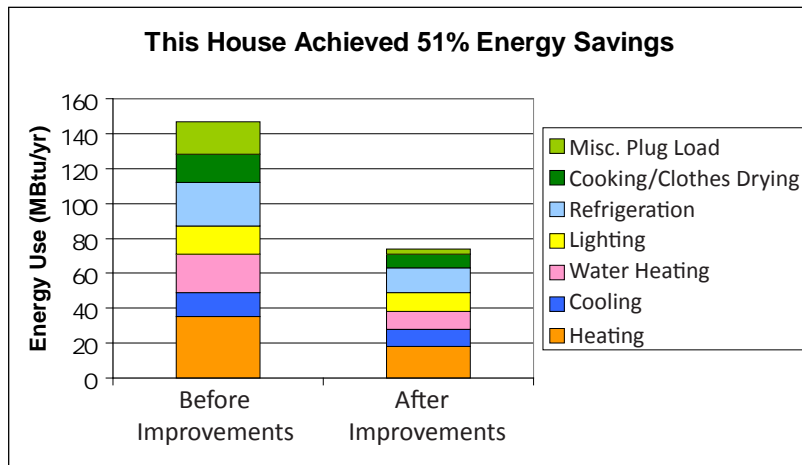
- Community and Economic Development Association (CEDA) Weatherization make homes more energy efficient for qualifying low-income clients in Chicago and suburban Cook County. These measures, such as repairing or replacing heating systems, sealing air passages and increasing insulation, can save more energy for homeowners while improving comfort. www.cedaorg.net; 800-571-CEDA (2332)
- The Low Income Home Energy Assistance Program (LIHEAP) assists low-income households to pay for winter energy services. The amount is determined by income, household size, fuel type and location. <http://ow.ly/2ziAx>; 800-571-CEDA (2332)
- The Delta Institute provides \$4,700 in weatherization services for eligible low and moderate income homeowners. A wide variety of services are offered, including an energy audit, homeowner training workshops, and assistance with energy bill monitoring for the following two year period. www.delta-institute.org; 312.554.0900
- Center for Neighborhood Technology (CNT) Energy Savers program serves multi-family buildings, 5 units and greater, affordable to renters with incomes less than 80% of HUD Chicago area median Income as per the Illinois Housing Development Authority FMR Schedule. www.cnt.org; 773.278.4800
- The Chicagoland Air Sealing Pilot program offers Chicago homeowners rebates of up to \$1,850 for air sealing your home and insulating your attic. Call 877.9080.9693 to request an application in the mail or apply online at <http://www.cntenergy.org/buildings/chicagoland-air-sealing-pilot/>
- The HEET Program, run by Greencorps Chicago, works to help low-income families and seniors save on winter heating bills by making simple energy efficiency improvements to the home. An application must be filled out to be considered for this free program. Once accepted, an appointment is scheduled for auditors to come out for an initial assessment. Depending on the results of the assessment, Greencorps may be able to provide a wide range of services such as sealing of air leaks and insulation. To learn more or to apply for the HEET Program, call 773.234.7711 or email HEET@energysaver1.com.

Where can I find incentives for making energy efficiency improvements?

- Peoples Gas and North Shore Gas are currently offering cash incentives for qualified gas saving products. Customers can apply for rebates for installing, high-efficiency gas furnaces and boilers. <http://www.chicagolandrebates.com/>; 866-964-7345.
- ComEd's Smart Ideas® programs feature services and incentives to encourage both business and residential customers to install energy efficient equipment and adopt energy efficient behaviors. ComEd.com; 888.806.2273
- Historic Chicago Bungalow Association (HCBA) Energy Efficiency Program provides income- and need-based funding to registered Chicago Historic Bungalow owners. www.chicagobungalow.org; 312.675.0300
- CUB (Citizens Utility Board) Energy Saver Program shows you steps to reduce your energy usage based on a personal savings plan: <http://www.cubenergysaver.com/teams/c-wat>. CUB's RecycleBank reward program to gain points for deals on groceries, gift cards and more. CUB Live Wire keeps updates on discounts, rebates and incentives to help you be more energy-efficient. <http://www.citizensutilityboard.org/ciLiveWire.html/>.

How much energy savings is possible if I go beyond the basics?

Artwork courtesy of Pacific Gas & Electric Company.
ACT2 Walnut Creek Residential Site: EEM Impact
Analysis, 1997. http://207.67.203.54/jelibs/q105_p40007_documents/ACT2/awainimp.pdf



The graph above shows the actual energy savings that were achieved in one typical single family home—about 50%! Such savings were accomplished using a variety of energy efficiency improvements which ranged in cost and complexity. These improvements ranged from simple steps like replacing incandescent light bulbs with CFLs to more expensive investments such as adding wall insulation and upgrading to high-efficiency appliances, heating, and air conditioning.

Going to the next level

After you've used the supplies in this hands-on kit, you might be interested in working with a certified energy auditor.

What do energy auditors do? As professionals, they perform on-site inspections and testing which identify the most cost-effective ways to save energy. Diagnostic tools are used to pinpoint hidden air leaks and defects. Such tools include an infrared camera, which shows temperature differences on outside walls, and a blower door, which depressurizes a house allowing for a systematic location of air leaks and a measurement of air lost to the outdoors.

After analyzing test results and observations from the survey, the energy auditor provides a written report that includes a prioritized list of recommended improvements along with their estimated costs and savings. Depending on the house, these improvements can range from insulating attics, walls, or basements, to closing air bypasses and upgrading heating systems.

Once the written report is received, you can think about getting bids from building contractors (see Incentives section on pg. 16.) Some energy auditors offer guidance during installation. Some insulation and heating firms hold energy auditor certification and offer "one-stop" services which combine testing for problems with installing solutions.

Who should get an energy audit?

Anyone interested in doing more to save energy and money, but especially if you:

- Have uncomfortable areas in your home; or
- Are considering investing in structural home improvements or remodeling (such as window replacement or adding insulation).

Professional associations with member firms that provide energy audits:

- Illinois Association of Energy Rates and Home Performance Professionals <http://www.ilenergyrates.org/>
- Residential Energy Services Network (RESNET); <http://resnet.us/>
- Building Performance Institute; <http://www.bpi.org/>

Home Energy Quiz Answers

All of the statements are energy myths and are **FALSE**.

1. Lowering the thermostat temperature, to say, 58 degrees, while asleep or away at work saves heating energy. Raising the temperature back to comfort levels makes the furnace or boiler run longer and more efficiently (reducing efficiency losses of cycling the equipment on & off). In other words, turning down the thermostat DOES save energy and money.
2. While technically true, turning lights off for even a few minutes is best.
3. Visit the Energy Star website before replacing failed appliances! Most refrigerators older than 1993 are so inefficient that replacing them before they fail is worthwhile. You might get paid to get rid of that old refrigerator in your basement.
4. A ceiling fan cannot lower air temperature. In fact, the fan motor increases room temperature slightly. Like any fan, it simply moves air. However, people in the path of the air flow feel cooler because it carries away body heat.
5. Because one feels cold drafts at windows and doors it seems that they are major culprits. However, the biggest leaks are elsewhere (see pie chart on page 2). We are simply unaware of warm air escaping through most leaks, such as through the attic.
6. Salesmen often misinform people about the energy savings of replacement windows. They have a 70-90 year payback. Repairing windows and adding low-e storms to old windows are more cost-effective measures.
7. Preventing moisture from entering the attic by air sealing the floor is the key to preventing condensation and mold in the attic. A well air-sealed and insulated attic floor is also key to keeping the living space below cool in summer (and warm in winter). The effect of adding more vents to an already vented attic is trivial.
8. Ducts in attics, vented crawl spaces, and attached garages can be a major source of air leakage and energy loss. Unsealed joints, disconnected ducts, and gaps between duct boots and finished surfaces are major leak problems. Leaky ducts may also contribute to ice dams, condensation problems, and carbon monoxide entry into the house from a garage.

Acknowledgements

Special thanks to energy product companies that assisted the selection of kit items:

- Conservation Technology, an energy product manufacturer and supplier, www.conservationtechnology.com
- Energy Federation, Inc, an energy product on-line store. ComEd clients receive a discount from retail cost. www.efi.org
- Green Depot, energy and green product supplier, 2500 North Pulaski Road, Chicago, IL, www.greendepot.com
- W J Dennis & Company, Elgin, IL, an energy product manufacturer, www.wjdennis-rcr.com/

Funding for this program was provided by People's Energy with oversight by the office of the Illinois Attorney General.

What's Your Climate Action?

If you've been taking some of these actions, you're off to a good start. These low-cost, do-it-yourself home weatherization measures will save energy and keep money in the bank. Plus, your impact on the environment will be a bit lighter.



Did you know the City of Chicago has an award-winning plan to tackle climate change? The Chicago Climate Action Plan is the City's blueprint to a more sustainable future. It outlines how we will achieve our greenhouse gas emissions goal of a 25% reduction below 1990 levels by 2020.

The success of the Chicago Climate Action Plan requires the commitment of every Chicagoan. Your small actions can amount to big change, especially if taken on a large scale. Each of us has a critical role to play. What role will you play? What's your climate action?

To learn more about the Chicago Climate Action Plan and what you and your neighbors can do, visit us on the web at www.chicagoclimateaction.org.

Credits:

This booklet was produced by eZing, Inc, a Chicago area energy guidance company, under contract with WRD Environmental for the 2011 City of Chicago Community Weatherization Action Teams.

Contents: Susan Casey, Jim Gill, Jim Laukes, Cheryl Pomeroy, John Porterfield, Kristen Pratt

Illustrations: Allie Tomkie

Design: Shelli DiFranco

Booklet concept: Jim Laukes

For more information, visit chicagoconservationcorps.org/blog/weatherization/