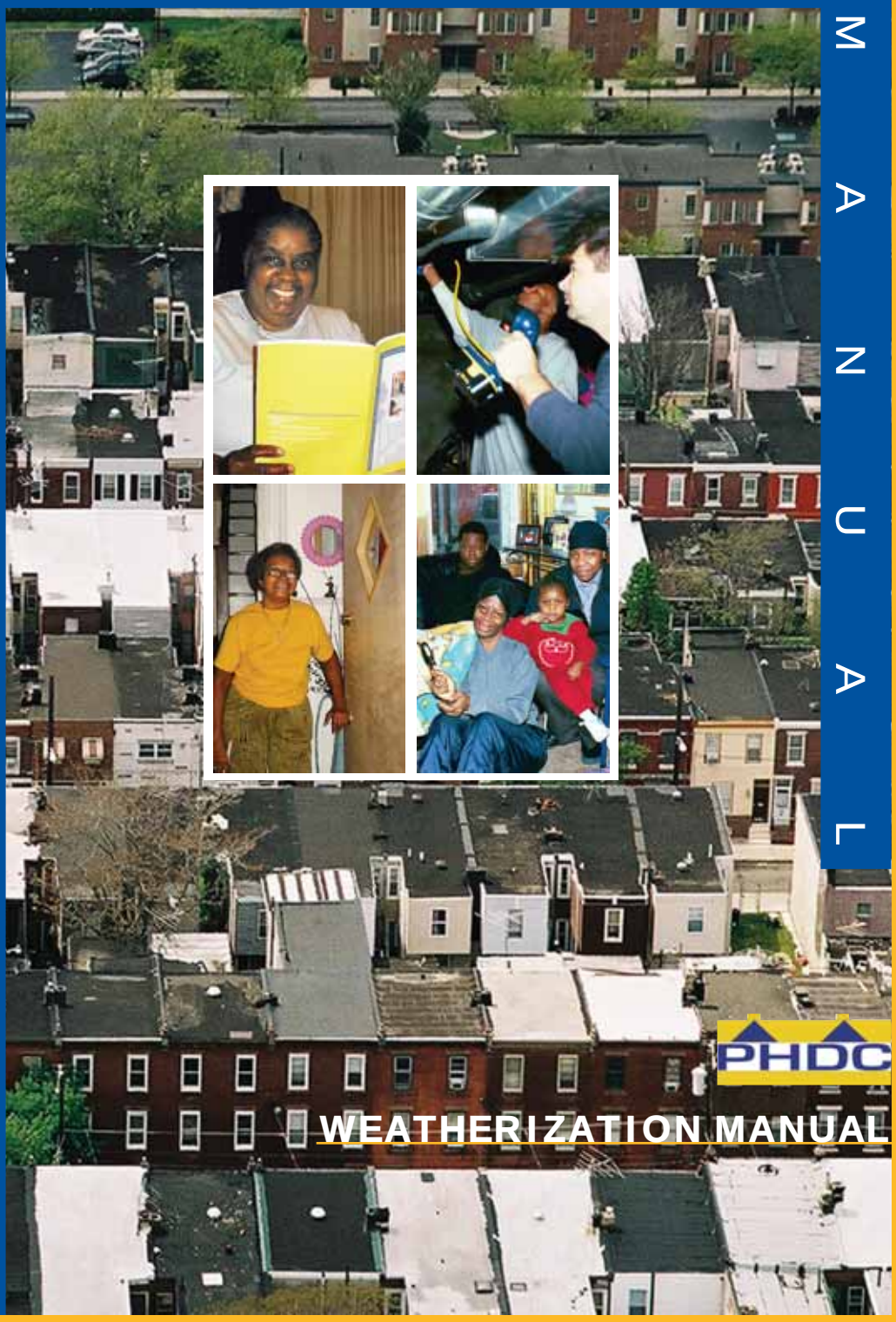
WEATHERIZATION MANUAL

PHILADELPHIA HOUSING DEVELOPMENT CORPORATION



PHDC

WEATHERIZATION MANUAL

NOTE TO THE READER

DISCLAIMER

The *Philadelphia Housing Development Corporation (PHDC) Weatherization Manual* offers general information on weatherizing your home and cutting energy costs for the low-income Philadelphia resident. PHDC has made every effort to ensure that the information and photographs in this manual are accurate.

Before beginning any home-maintenance project, you should plan thoroughly, carefully assessing your own skill level, available tools and working conditions. Always follow appropriate safety precautions, the manufacturer's instructions and recommendations for the equipment, and City of Philadelphia codes and regulations. For assistance, contact licensed professionals or local home-improvement sources.

PHDC is not liable, under any circumstances, for any loss of life, bodily injury, personal injury, property damage including loss of use therefrom, claimed to be as a result of the reader's use of information contained in this manual.

October 2006

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Our goal is to help you make your home ENERGY EFFICIENT.

This saves you money and protects natural resources.

INTRODUCTION

Congratulations from the Philadelphia Housing Development Corporation (PHDC)! You will soon be saving energy and money, thanks to the energy-conservation features installed in your home through PHDC's Weatherization Assistance Program.

To help you maintain those features, PHDC has prepared the *Philadelphia Housing Development Corporation Weatherization Manual.* Gas and oil prices are rising; this manual will teach you cost-effective ways to reduce your household's energy use, especially during the winter.

Visual inspection

Weatherization Assistance Program

PHDC's Weatherization Assistance Program (WAP) provides free weatherization and energy-efficiency improvements to eligible owner-occupied houses and tenant-occupied rental units located in the City of Philadelphia.

PHDC begins its assessment of your property with an energy audit. Using state-of-the-art diagnostic equipment, PHDC determines air leakage, the condition of your heating system and other energy-related information about your home. It also identifies improvements that can save both energy and money.

A blower-door is used during an energy audit to find air leakage.

Your property may receive a combination of the following services:

- ❑ A blower-door test to locate air leakage.
- ❑ Air-sealing to reduce the leakage while maintaining an acceptable level of ventilation that will sustain good indoor air quality.
- ❑ Air-sealing, installation of insulation and ventilation of the roof area or crawlspace to reduce the loss of energy through the building.
- ❑ Weatherstripping, caulking and repair of primary windows and doors.

INTRODUCTION

- ❑ Modifying or replacing the heating system to increase its efficiency and/or safety; may include combustion venting and heat-distribution repairs.
- ❑ Wrapping of hot-water heaters, heating pipes and ducts.
- ❑ Sealing of basement openings, crawlspaces and chaseways.
- ❑ Installation of a partition wall under a porch to help insulate the basement.
- ❑ Installation of a new thermostat.
- ❑ In-home energy education.

Energy improvements such as adding insulation to the basement last as long as the house stands.

Income Guidelines

To be eligible for WAP, your monthly income cannot be more than 150 percent of the federal poverty guidelines. For example, the monthly maximum income for a household of four in 2006 is $2,500. Income guidelines are subject to change every year.

How to Apply

Applications are only taken by telephone. Before you call, gather the following information:

- Amount of total monthly household income;
- Source of that income; (employment, SSI, DPA, etc.);
- Number of people in your household;
- Your Social Security number.

Energy Education

You must get involved in making your home energy efficient. The *PHDC Weatherization Manual* will teach you how to:

- Maintain the weatherization improvements made to your home.

Call PHDC's

Weatherization Assistance Program

215-448-2160

weekdays 8:30 a.m. to 4:30 p.m.

(Hearing impaired only, call TDD 215-448-2184.)

INTRODUCTION

- Read your utility meters and energy bills so you can control your energy usage.
- Identify items in your house that use the most energy and cost the most to run.
- Conserve energy and save money on your energy bills.
- Understand the EnergyGuide labels on appliances and materials.

Weatherization Reduces Your Energy Bills

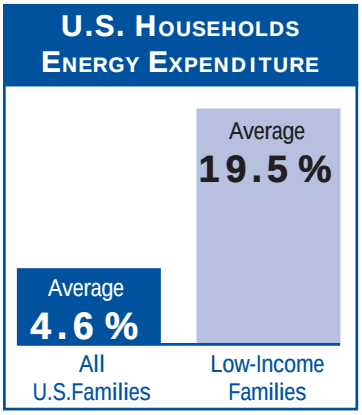
Low-income households spend much more of their money on energy bills than those with median incomes. Some senior citizens on fixed incomes pay as much as 35 percent of their annual income for energy bills.

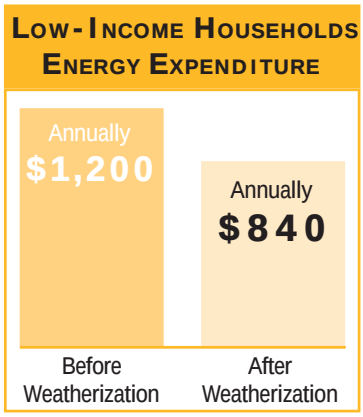
PHDC's Weatherization Assistance Program serves households like yours by helping you reduce your energy bills. It produces long-lasting benefits for you and an economic boost for your community.

The chart below shows weatherization can reduce heating bills by an average of 30 percent per year.*

In-home education

Energy efficiency results in savings that can be counted on year after year.





** US Department of Energy, Office of Energy Efficiency and Renewable Energy*

and

"The Cold Facts: First Annual Report on the Effects of Home Energy Costs on Low-income Americans"

supported by:

The National Low-Income Energy Consortium(NLIEC)

The National Energy Assistance Directors'Association (NEADA)

The National Fuel Funds Network

and

www.acf.hhs.gov/programs/liheap/data/notebook

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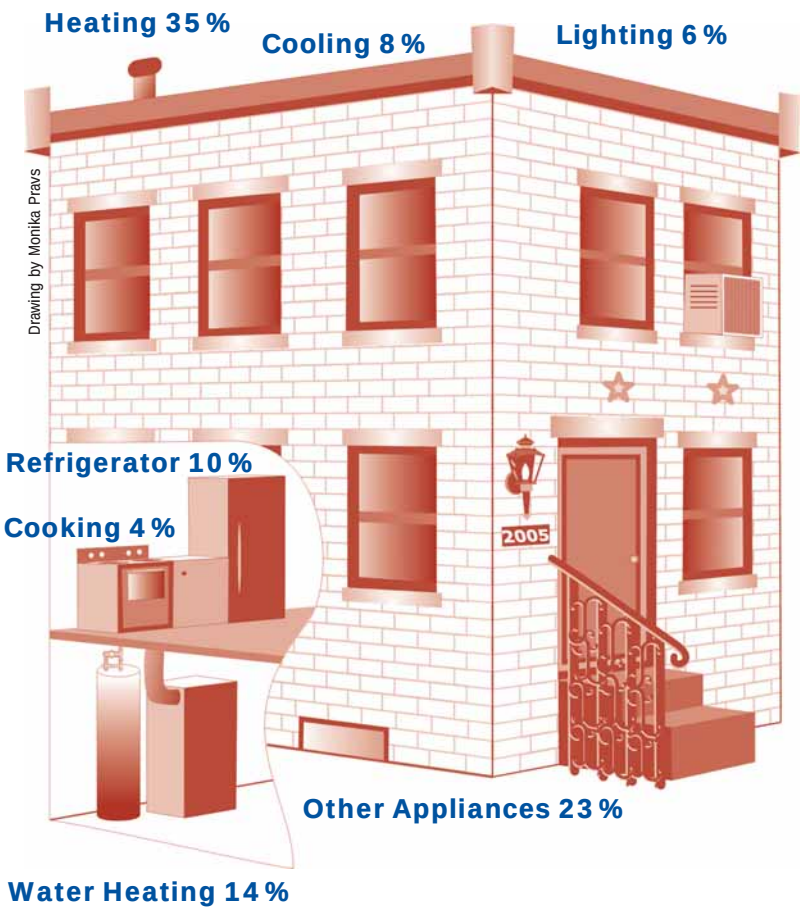
AVERAGE ENERGY USE IN A PHILADELPHIA ROWHOUSE

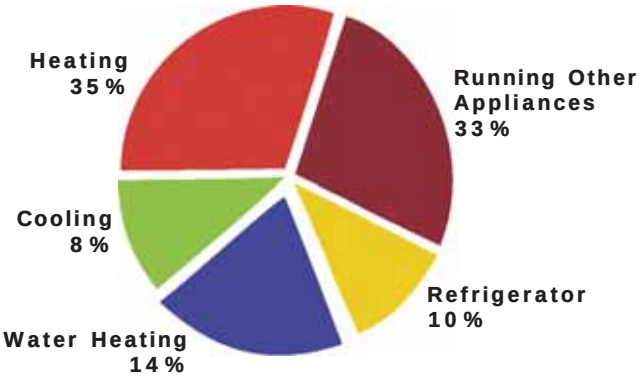


ENERGY USE

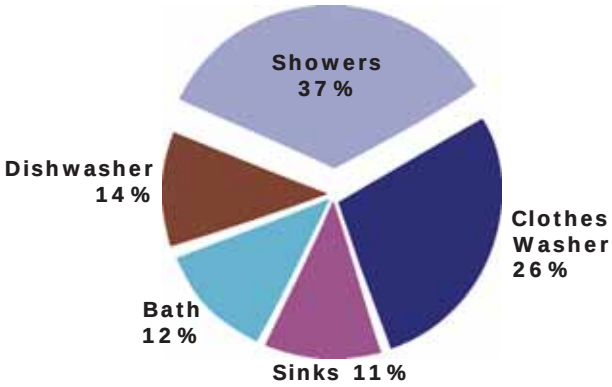
ENERGY USE

AVERAGE ENERGY USE IN A PHILADELPHIA HOUSEHOLD*

YOUR AVERAGE ENERGY BILLS GO TO:



YOUR AVERAGE WATER HEATING COSTS ARE:



Your heating and electric bills are higher in the winter for several reasons:

- Your furnace is on during cold months, burning gas or oil, and using electricity to power the fan that operates it.
- A water heater located in an unheated space must work harder when the air around it is cold, thereby consuming more energy.
- You tend to be home more in the winter, thus using more electricity for lights and appliances.

By making the changes and improvements outlined on the next pages, you can reduce your energy bills.

** US Department of Energy, Office of Energy Efficiency and Renewable Energy and www.acf.hhs.gov/programs/liheap/data/notebook*

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YOUR METERS AND BILLS

METERS AND BILLS

Meters measure and record the amount of energy used in your home. Readings from the meter are the basis of your monthly energy bills. To save money, you must first see how you are using energy.

Reading your meters and bills will help you:

1. Learn how you are using electricity and gas.
2. Manage your household's daily energy use.
3. Estimate the amount of your next month's bills.
4. Monitor your use over a 12-month period.
5. Chart a seasonal picture of your home's energy use.

Electric dial meter

How to Read Your Electric Meter

An electric meter's dials record your household's electric consumption; a metal disc in the meter revolves whenever you use power in your home. Electric power is measured in watts: 1,000 watts are called a kilowatt. If you use 1,000 watts of power in one hour, you used a kilowatt-hour (kWh). The electric company bills you by the kWh.

Meters contain four or five dials with pointers that move in opposite directions. Each pointer represents a single number in the reading.

1. To record your meter reading, write down the numbers from each dial starting at the left. If the pointer is between two numbers, write down the lower number. If the pointer is between 9 and 0, write down 9.
2. Repeat this procedure until you have a number for each dial.

The picture below shows a correct reading of 73256 for the electric meter dials.

METERS AND BILLS

How to Read Your Gas Meter

A gas meter is driven by the force of the moving gas in the pipe; its dials turn faster as the demand increases. Gas meters register 100s (CCF) or 1,000s of cubic feet (MCF) of gas usage. Your gas meter may have a read-out number or four or five dials in a row that measure the gas. The two dials in the lower row are used by the gas company for testing and calibration.

Gas meter with dials

Gas meter with read-out number

To learn how much electricity and gas you use:

1. Read your meter at the beginning and again at the end of the month.
2. Subtract the lower number from the higher number.
3. The difference tells you how many kWh of electricity or cubic feet of gas you used.
4. Repeat in different seasons of the year such as winter (January), spring (April) and summer (July) to see how the weather affects your energy use.
5. Chart during which months you are spending the most money. Look at cutting costs during those times.

Understanding The Results

Charting your energy bills over 12 months will show you your family's energy-use patterns. You will see the high costs of washing laundry using hot water, turning up the heat on a cold day or doing a lot of cooking in the oven. Once you've identified how you're using energy, you can manage it more efficiently and reduce costs. For example, you can wash clothes in warm or cold water, put on a sweater instead of turning up the thermostat, use a microwave instead of the oven. In summer use an outdoor grill.

INFORMATION:

PGW: Key Telephone Numbers

Appliance Service ... 215.235.2050
General Info 215.235.1000
Report a Gas Odor .. 215.235.1212
Spanish Hotline 215.235.2175
Hearing Impaired 215.236.4646

METERS AND BILLS

How To Read Your Energy Bills

Rate R Electric Residential Service — Meter# 9G 131251

To September 15, 2006 — 47673 - Actual Reading

From August 16, 2006 — 46907 - Actual Reading

Kilowatt hours (KWh) billed for 30 days — 00766

ENERGY Charges

Customer Charge 5.18

Generation and Transmission Charges

($.0657 x 500.0000kWh)

($.0738 x 266.0000kWh) 52.48

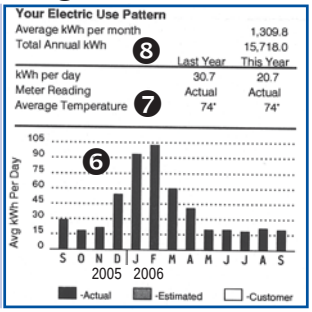
Distribution Charges 37.87

Transition Charges 22.54

Total Charges for 686 kWh 118.07

State Tax Adjustment ..... -0.48

New Charges 117.59



PGW

Customer's name
Customer's address

Page: 3 of 3
Billing Date: 9/04/2006
Account Number: xxxxxx

Current Basic Charges

SA ID # 6789012345, 123 Lake Street
Rate Class: GS Residential Heat and Domest

Supply Charges

Commodity Charge 175 Ccf@ $1.16786 ..... $204.38

Total Supply Charges $204.38

Delivery Charges

Customer Charge @ $12.00 ..... $12.00

Distribution Charge 175 Ccf @ $0.70403 ..... $123.21

Gas Cost Adjustment @ -$0.04228 for 30 days ..... CR $7.40

Total Delivery Charges $127.81

Total Current Billing Charges $332.19

Non Basic Charges

8/15/2006 - Merchandise Repair Charge $50.00

Total Non Basic Charges ..... $ 50.00

Meter Detail — Meter #: 2223344 — Service Point: 911011201 — Next Meter Read: 10/03/2006

From Date	From Reading	From Type	To Date	To Reading	To Type	Difference	Usage (Ccf)	Conversion Factor	Total Therms
8/01/2006	12200	Actual	9/02/2006	12375	Estimated	175	175	1.028	179.9

Energy Usage Information

COMPARATIVE GAS USAGE

	This Month, This Year	Last Year
Avg Daily Usage (Ccf)	5.8	6.0
Billing Days	30	29
Avg Daily Cost	$11.073	$9.55

HISTORICAL DATA — SONDJFMAMJJAS — Actual Estimated

LAST 12 MONTHS
Total Ccf 1705
Avg Ccf 142

(Gas bill only) Weather Normalization Adjustment (WNA) This item can either reduce or add to the bill's non-gas charges, depending on weather conditions. It will result in a reduction when temperatures are colder than normal and an increase when the temperatures are warmer than normal. Over time, these adjustments balance each other out. The adjustment affects only customers who heat with gas and appears on bills only during the heating season. For budget billing customers, the WNA will be factored into budget payments during quarterly reviews and adjustments. *(Source: www.pgworks.com)*

Information on your energy bills:

1. The meter number
2. The beginning and ending dates of the billing period
3. The beginning and ending readings for the billing period
4. The total number of days in the billing period
5. The number of kWh (electricity) or Ccf (gas) billed
6. A bar graph shows you your pattern of use for the past 12 months. You should expect to see the bars much higher in the winter months.
7. The average daily temperature (electric only)
8. The average daily kWh or Ccf used for the current month compared to the previous year.
9. The generation (electricity) or delivery (gas) charge - cost of each kWh or Ccf. This number fluctuates monthly. Multiply this number by the number of kWh or Ccf used to produce your electricity or gas cost - this is the number you can impact by saving energy.

Additional items which can add about 50% more to the bill.

A. Transmission and distribution charges (electricity); delivery (gas)

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WEATHERIZING

WEATHERIZING

Cold air leaking in leads to heat loss and can significantly increase your energy bills. Weatherizing your home can lower your heating bills by as much as 31 percent. Weatherize in the fall before cold weather sets in.

You should:

- Repair any holes, gaps, broken windows or doors.
- Caulk small cracks, holes and gaps.
- Tighten window locks, screws and door hinges.
- Adjust or replace worn thresholds and door sweeps.

PHDC provides weatherization clients with a free caulk gun and tube of caulk to assist with maintenance.

CAULKING

The PHDC Weatherization Assistance Program caulks your primary windows and doors to reduce the amounts of cold air seeping into your home and hot air leaking out. This energy-saving feature must be maintained. Check annually to see if the caulking has shrunk, cracked or fallen out. Recaulk if necessary.

- Use a caulk gun, tubes of caulk printed with the words “Windows and Doors,” backer rope and work gloves. The most common caulks are latex, acrylic and silicone. Silicone is best for sealing gaps both indoors and outdoors.
- Windows and doors are the largest areas of heat loss so look for gaps around them. Follow the manufacturer’s instructions on preparing surfaces and caulking.
- Apply silicone caulk around dryer and fan exhaust vents.
- Seal around spigots, TV cable jacks and telephone hookups.
- If your house has siding, stuff backer rope into gaps between the house and siding.

Leaking air wastes your energy dollars. Caulk, seal and weatherstrip all seams, cracks and openings to the outside. You can save 10 percent or more on your energy bill by reducing the air leaks in your home.

WEATHERIZING

Weatherstripping

The PHDC Weatherization Assistance Program will install weatherstripping around movable parts of your windows and doors to stop the airflow. Make sure it stays in place and repair any loose areas as needed with glue or nails.

Rubber foam weatherstripping

Replacement weatherstripping is available at hardware stores. Choices include foam rubber, EPDM rubber, felt, bent metal and plastic

Consider the durability of the weatherstripping material as well as its suitability for your project. Bent brass and aluminum strips are durable but very expensive, conduct heat easily, don't seal well and are easily damaged. Bent plastics are less expensive and less durable. Most rubber and foam materials stay flexible for years, are inexpensive, easily replaced and seal air leaks effectively. Choose the appropriate door sweeps and thresholds for the bottoms of doors.

Firmly install weatherstripping.

Make certain the weatherstripping material will stay flexible under extreme weather conditions. Follow the manufacturer's instructions for installation. In general, you should:

1. Weatherstrip the entire doorjamb.
2. Apply one continuous strip along each side.
3. Make sure the stripping meets tightly at the corners.
4. Use a thickness that tightly presses between the door and the doorjamb without making the door hard to close.

Air enters your home through every gap large and small.*

Ceilings, walls, floors	31%
Ducts	15%
Plumbing	13%
Doors	11%
Windows	10%
Fans and vents	4%
Electric outlets	2%

** U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy*

WEATHERIZING

Wrapping

- Wrap exposed hot-water pipes in your home with foam tubing and insulating tape. Wrap exposed cold-water pipes located in places where they might freeze, such as crawlspaces, garages and at the water meter.
- If your water heater is more than five years old, contact a licensed plumber to wrap it with an insulation blanket.

Insulated water pipes

Insulating

Under the Weatherization Assistance Program, PHDC may insulate your roof/attic but not the crawlspace. To benefit even more from weatherization, add insulation to the walls of the crawlspace or the floor above it. Insulation reduces the costs of heating and cooling your home. Home insulation is coded by R-value. “R” means resistance to heat flow. The higher the R-Value the higher the insulating capability. The chart below will help you determine which R-value to use in each section of your home.

Insulate joist pockets to outside wall.

	Gas / Heat Pump	Electric Furnace
Ceiling Area	R-Value	R-Value
Attic	R-49	R-49
Wall	R-18	R-22
Floor	R-25	R-25
Crawlspace	R-19	R-19
Basement Area	R-Value	R-Value
Interior	R-11	R-19
Under porch	R-10	R-15

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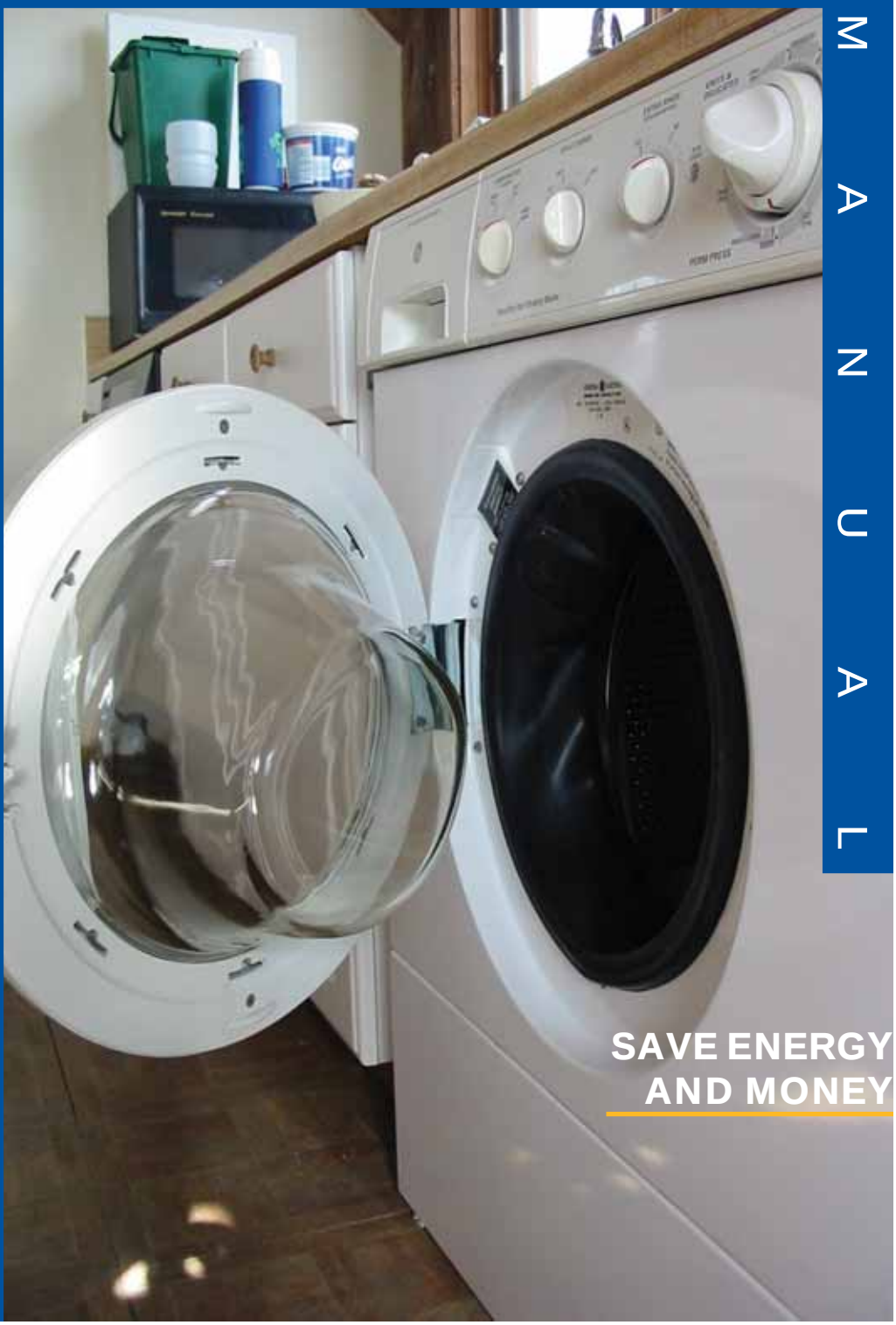
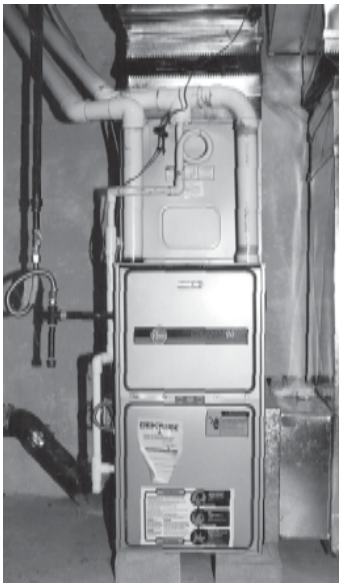


SAVE ENERGY AND MONEY

COMFORT SYSTEMS

The heating and cooling systems in your home are called "comfort systems." By maintaining the house's air temperature and humidity within the acceptable range of comfort (between 65 and 78 degrees), they keep you warm in winter and cool in summer.

Natural gas or oil powers your furnace; electricity runs your air conditioning. Utility bills increase up to 5 percent for each degree of heating/air conditioning above/below the comfort level. Perform preventive maintenance regularly to keep comfort systems running efficiently.

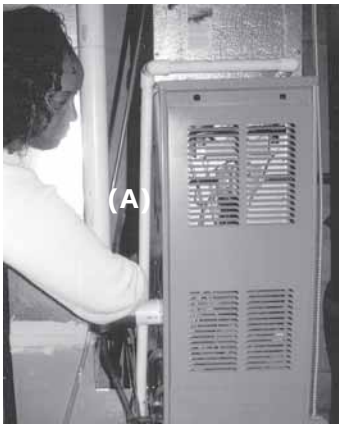


High-efficiency gas furnace

Preventive Maintenance — Heating System

- It's too dangerous to service your furnace yourself. If you have its annual Parts and Labor Plan, the Philadelphia Gas Works (PGW) will repair your gas furnace. Call 215-235-2050 for an appointment. Call a licensed heating contractor to service gas furnaces not covered by the PGW plan and for oil furnaces.
- Check that your heater is working by turning the thermostat up five degrees above room temperature. If the heater doesn't start up, call immediately for service. Contact PGW at 215-235-2050 if you have its annual Parts and Labor Plan. Otherwise call a licensed heating contractor.
- Inspect all furnace pipes and vents for holes, cracks and blockages. Carbon monoxide from the furnace can enter your house through these defects and cause sickness, even death. If you find problems, immediately contact PGW at 215-235-2050 if you have its annual Parts and Labor Plan. Otherwise call a licensed heating contractor.
- If you're a low-income homeowner and need heating repairs, call the Heater Hotline at 215-568-7190. If you're a renter, call 215-686-2590.

- For safety, install smoke and carbon monoxide detectors outside all sleeping areas.
- Inspect the furnace filter every month during the heating season; replace when dirty. A clogged filter reduces heat output by up to 70 percent.



To clean or replace furnace filter, remove, wash, dry and replace.

Replacing the Furnace Filter

Follow these easy steps:

1. Note the filter's size; replace with the same size only.
2. Turn off thermostat.
3. Find the slot **(A)** between the blower motor and cold-air return that contains the filter.
4. Remove cover and slide filter out.
5. Slide new filter in according to the airflow arrows which should face inside of heater.
6. Replace cover.
7. Turn thermostat back on.

Programmable Thermostat

To maximize your energy savings install an automatic setback or programmable thermostat. These adjust the temperature setting. You might forget to turn down the heat before you leave the house in the morning but a programmable thermostat won't!

With a programmable thermostat you can:

- Store and repeat weekday settings which you can manually override without affecting the rest of the daily or weekly program.
- Set a different pattern for the weekend.

Before installing a programmable thermostat, chart your weekly habits such as the hours you wake up and go to bed, leave home and return. Decide which temperatures are most comfortable for your household during those

Radiators

If your home is heated through steam or hot water radiators, your furnace (boiler) will not contain a filter. To keep radiators providing heat efficiently, you must "bleed" them of unwanted air. In the fall, turn on the heat. Starting on the top floor, open each radiator bleed valve slightly with a radiator key. Close the valve when water starts to come out. Place a small pan under the valve to catch the drops.

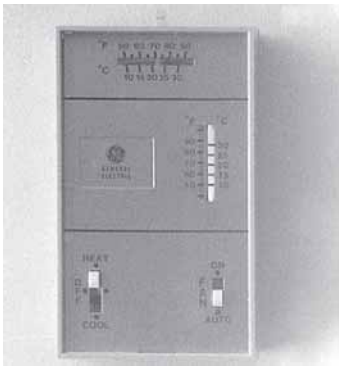
times. This will help you decide which thermostat settings will best serve your household's needs. Here is an example of a programmed thermostat:

Mon.	Tue.	Wed.	Thu.	Fri.	Sat.	Sun.
6 am 68°F	6 am 68°F	6 am 68°F	6 am 68°F	6 am 68°F	8 am 68°F	8 am 68°F
7:30 am 62°F	7:30 am 62°F	7:30 am 62°F	7:30 am 62°F	7:30 am 62°F		
5 pm 68°F	5 pm 68°F	5 pm 68°F	5 pm 68°F	5 pm 68°F		
10 pm 59°F	10 pm 59°F	10 pm 59°F	10 pm 59°F	10 pm 59°F	10:30 pm 59°F	10:30 pm 59°F

Programmable thermostat

Heating Checklist

- ❑ Turn the thermostat down to 59 to 62 degrees at night and when no one is home.
- ❑ When you're home, keep the thermostat at 68 degrees or lower.
- ❑ Keep all storm doors and windows tightly closed.
- ❑ Close doors to all unoccupied rooms.
- ❑ Turn the heat off and close the dampers on heat vents to unused rooms.
- ❑ Clean and replace furnace filters regularly.
- ❑ Dress warmly in layers to hold in body heat.
- ❑ Use kitchen and bath ventilating fans to pull out excess moisture immediately after cooking or showering.
- ❑ Open shades and drapes on south-facing windows during the day and close at night.
- ❑ Move furniture away from heating vents and radiators.



Turning your thermostat down by 10 to 15 degrees for eight hours daily can save about 5 to 15 percent a year on your heating bill.

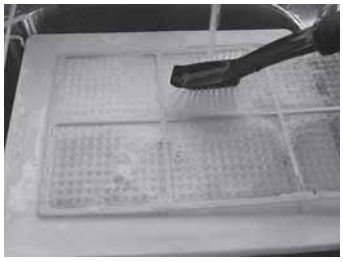
Window-Mounted Air Conditioners

A room air conditioner is mounted in a window and cools a single room. Since many of its parts are factory sealed and permanently lubricated, it requires little maintenance. To keep it running efficiently:

- Clean the filter during the summer at least once a month as dirty, clogged filters force the unit to work harder and run longer. Unplug the unit, remove the grill and take out the filter. If disposable, replace it. If permanent, wash in warm, soapy water, let dry and replace. Plug the unit back in.
- Vacuum the condenser coil frequently.
- Check the fins (metal grill or spines) on the outside of the unit. Clean if clogged: straighten with a fin comb if bent.
- If you leave the unit in the window year-round, close the vents and protect the unit with a waterproof cover during the winter.

Cleaning air-conditioner filter:

Step 1: Remove air-conditioner filter.



Step 2: Wash and dry, then replace.

Central Air Conditioning

Central air conditioning will work effectively for years if maintained with regular cleaning and inspections by a licensed air-conditioning contractor.

Central air conditioning unit may be located either in your yard or on the roof.

Cooling Checklist

- ❑ Set your thermostat at 75 degrees or higher when no one is home or at bedtime. You can cool it down when you return or wake up. Window units can be turned on and off from a special timer available at hardware stores.
- ❑ If you keep pets inside in the summer, be sure they have adequate ventilation or cooling on hot days.
- ❑ When practicable, run fans instead of air conditioning to achieve comfort and reduce energy costs.

ENERGY-EFFICIENT WATER HEATING

To decrease water-heating costs, reduce your use of hot water and make your water-heating system more energy efficient. Key users of hot water are faucets, showers, clothes washers and dishwashers.

Typical hot water use in gallons

Faucets and Showers

Repairing leaks in faucets and showers will save hot water. Turning the hot-water faucet off while shaving or washing and limiting the amount of time you spend in the shower reduce water-heating costs.

A leak of one drop of water a second can waste 3,000 gallons a year plus the fuel used to heat it.

Installing low-flow showerheads reduces hot-water consumption by 30 percent. To determine if you need a showerhead replacement, turn on the shower, hold a one-gallon container under the spray and time how many seconds it takes to fill it. If less than 20 seconds, you could benefit from changing to a low-flow showerhead. It will cost about $10 to $20 and pay for itself in energy saved within four months.

Low-flow showerhead

Clothes Washers

Up to 90 percent of the cost of operating clothes washers is from the energy needed to heat the water. Unlike dishwashers, clothes washers don't require a minimum temperature for optimum cleaning. Most laundry loads can be washed in either cold or warm water with a cold-water rinse. Washing only full loads reduces hot-water consumption.

Automatic Dishwashers

A common misconception is that washing dishes by hand saves hot water. Washing several times a day is more expensive than operating an automatic dishwasher with a full load once a day. Heating water for an automatic dishwasher represents about 80 percent of its energy

cost. Cycle selections save energy; for example, shorter cycles require less water. The energy-saving cycle uses less energy to dry dishes than the heat cycle.

Foam insulation for water pipes

Water heater with blanket

Insulate Hot-Water Pipes and Water Heater

When you turn on a hot-water faucet during cold weather, it takes several seconds for the water to become hot. That's because the water travels through pipes from the water heater to the faucet and some of the pipes may pass through unheated sections of the house, such as the basement. As a result, the hot water loses heat to the surrounding space.

You can reduce this loss by insulating hot water pipes wherever they are accessible. Use quality pipe-insulation wrap.

Insulating your hot-water heater is a fairly simple and inexpensive improvement that can help maintain the water temperature at the thermostat setting. Some newer models of water heaters are well-insulated and don't need an added layer. However, a heater warm to the touch needs additional insulation. If appropriate, PHDC will insulate the heater during its weatherization of your house.

Easy-to-install, pre-cut blankets or jackets for electric water heaters are widely available and cost from $10 to $20. When properly installed, a blanket will pay for itself in energy saved within one year. Installation is more difficult on gas- and oil-fired heaters so you may want to hire a licensed heating contractor.

If your water heater is more than seven years old, carefully evaluate your water-heating needs. Check out new replacement heaters. Although most water heaters last 10 to 15 years, timely replacement will ensure savings of both money and energy.

Lower Your Water-Heater Thermostat

One simple step for reducing water-heating energy costs is lowering the thermostat setting on your water heater. Although some manufacturers set water heaters at 140 degrees F, 120 degrees F is satisfactory for most household needs. Water at 140 degrees can pose a scalding hazard. Each 10-degree reduction in water temperature can reduce water-heating costs by 3 to 5 percent.

Thermostats are usually visible on gas water heaters. Electric water heaters may have two thermostats — one each for the upper and lower heating elements — located behind screw-on plates. As a safety precaution, shut off electric current to the water heater before removing the plates. Since adjusting the thermostats is tricky, you may want to refer to a plumbing manual or hire a licensed plumber.

Awnings help reduce heat gain in summer.

ENERGY-EFFICIENT WINDOWS

Windows can be major sources of heat loss in the winter and heat gain in the summer. However, when properly selected and installed, windows can help minimize a house's heating, cooling and lighting costs. To reduce heat loss or gain, weatherstrip, caulk and repair your house's primary windows. Low-cost improvements you can add are window films and window treatments.

Storm windows increase the efficiency of single-pane windows. Simplest is plastic film attached with double-faced tape to the inside of the window frame. This is available in prepackaged kits at hardware stores. Rigid or semi-rigid plastic sheets such as Plexiglas are fastened directly to the outside window frame.

You can also insulate with shades, drapes, awnings, shutters and screens.

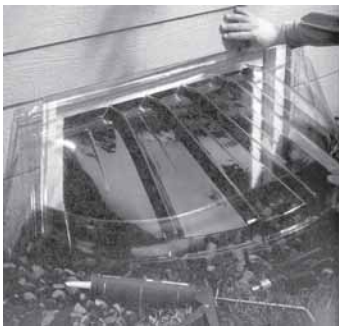
SAVE ENERGY AND MONEY

Replacing windows will involve purchasing new materials that should feature the Energy Star label. A fixed-pane window is the most airtight and the least expensive. A window with a wood frame has less conductive heat loss than one with an aluminum frame. Double-pane, low-e window units are just as efficient as triple-pane untreated windows but cost and weigh less.

Energy Star label

Basement Window Well Covers

Measure the widest part of the well to get the cover size. Follow manufacturer's installation directions and seal the cover with caulk. Do not cover a dryer-vent window.



Covering a window well

Basement Partition Area

Keep closed during the winter.

ROOF AREA

Flat roofs: are susceptible to leaks because they don't have gutters. Water is discharged directly into a downspout through a gap in the parapet or fascia. Inspection and maintenance are very important. Hire a licensed roofer to check for cracks and puddles and to make sure downspouts are free of obstructions. White or silver roof coatings can significantly extend the life of flat roofs and keep the house cooler in summer.

Unclogging a downspout

Gutters and downspouts: carry water away from the house. If these leak or get clogged, they can damage siding and undermine the house's foundation. Check them at least twice a year, preferably in May after nearby trees have bloomed and again in November after leaves have fallen. Follow these maintenance steps:

- Use a gutter scraper to remove objects from gutters.
- Pour water into each gutter with a hose or bucket, watch for proper drainage and for leaks.

- If the water doesn't drain completely, adjust the gutter so that it slopes toward the downspout.
- Clear clogs in downspouts with a hose set at full pressure or with a plumber's snake.
- Repair gutter leaks immediately. Use a wire brush to remove loose metal and rust from small leaking holes. Wipe clean with a cloth, spread a patch of asphalt roofing cement with a putty knife. Fix larger leaks by cleaning the area and then apply a thin layer of cement. Place a canvas patch over the hole and apply a second heavy coat of cement to seal it.

LIGHTING

Lighting accounts for around 20 percent of the electricity consumed in the United States. Turning lights off when not needed is a low-cost technique that reduces energy consumption and saves money, depending on the type of bulb and the price of electricity.

Incandescent light bulbs are relatively inefficient. Only about 10- to 15-percent of the electricity they consume results in light—the rest is turned into heat. Turning these lights off will keep a room cooler, an extra benefit in the summer. The energy thus saved will be far greater than the cost of replacing the bulb.

Compact fluorescent light bulbs (CFLs) are smaller versions of standard fluorescent light bulbs, consuming between 5 to 40 watts with a brightness and color rendition comparable to incandescent lights. Unlike standard fluorescent lights, they can directly replace standard incandescent bulbs.

OUTDOOR LIGHTING

1.Motion Detectors

The light only goes on when the detector senses motion, such as when you come home at night.

2. Photoelectric Switches

These switches automatically turn lights on at dusk and off at dawn. You never have to worry about accidentally leaving a light on all day.

*If every U.S. household replaced one incandescent light bulb with a CFL, it would prevent pollution equal to removing one million cars from the road.**

	27 Watt CFL	100 Watt Bulb
Cost	$6.00	$0.50
Days lasts	1642.5	167
Annual Cost	$5.91	$21.90
Replaced in 4.5 years	0	10
Total Cost	$32.60	$103.55
Savings	$70.95	

US Department of Energy, Office of Energy Efficiency and Renewable Energy

** Energy Star website*

APPLIANCES

Appliances account for 27 percent of your energy bill — refrigerators, clothes washers and dryers top the list. About 80 percent of the energy used for washing clothes is to heat the water. Your refrigerator alone accounts for 9 percent of your energy bill. Some old appliances are extremely expensive to run so a new energy-efficient appliance will pay for itself in energy savings. (See page 29.)

Refrigerator and freezer temperature dials may use letter and number ranges. To determine your refrigerator or freezer temperature, place a thermometer inside and read it after 24 hours.

Laundry

- Wash and dry only full loads of laundry.
- Switching the temperature setting from hot to warm can cut a load's energy use in half.
- Keep the lint screen on your clothes dryer clean.
- Dry clothes outdoors on clotheslines.

Refrigerator and Freezer Use

- Keep the door closed. Staring into an open refrigerator while you decide what you want can cost you $20 a month.
- Set the refrigerator temperature dial at 37 to 40 degrees F and your freezer's at 0 to 5 degrees F.
- Leave room in your refrigerator for the air to circulate but keep your freezer full.
- Defrost frozen foods overnight in your refrigerator.
- Keep the coils behind or under the refrigerator clean.
- Defrost your freezer when ice builds up.
- Replace the door seal if air is leaking out. Test for tightness by closing the door over a dollar bill placed partially inside it. If you can pull the dollar out easily, the seal should be replaced.

Testing a refrigerator's seal.

SAVE ENERGY AND MONEY

In the Kitchen

- Do only full loads in your dishwasher: use the energy-saving cycle or open the door to air-dry the dishes.
- Prepare small meals in a microwave or toaster oven.
- Avoid opening the oven door while cooking.
- Never use your stove as a heater.

COMPUTERS

The number of homes with computers is growing. Turning computers off when they are not in use is a low-cost technique that reduces energy consumption and saves money. Computers have two components that can be turned off: the monitor and the central processing unit (CPU) or what you know as your computer. The CPU can go into sleep or hibernate mode. Note that the screen saver may actually use more energy while it protects your monitor.

If you won't be using your computer for more than 20 minutes, turn the monitor off; more than two hours, also turn the computer off. If you use your computer during an eight-hour period but have 20- to 60-minute breaks, turn the monitor off and use the power-down feature during each break. Turn all components off if you won't be using the computer for more than four hours.

Exceptions are if the computer:

- has a very old hard drive;
- operates or monitors some other device such as phone/fax, printer or home security system; and/or
- is part of a network file-sharing operation.

Energy Use

Estimated Operating Costs*

Air Conditioner Window	0.75 kWh/hour	11 ¢ hour
Air Conditioner Central	0.75 kWh/hour	52 ¢ hour
Clothes Dryer	5.0 kWh/hour	75 ¢ hour
Clothes Washer	0.5 kWh/hour	7 ¢ hour
Dishwasher	1.3 kWh/hour	19 ¢ hour
Fan: Window	0.2 kWh/hour	1 ¢ hour
Freezer: Chest (15 cu. ft.)	0.335 kWh/hour	$1.20 day
Microwave Oven	2.0 kWh/hour	19 ¢ hour
Personal computer	0.2 kWh/hour	3 ¢ hour
Range - 4 burner	1 kWh/hour	15 ¢ hour
Refrigerator: Frost Free	0.5 kWh/hour	$1.80 day
Refrigerator: Standard	0.3 kWh/hour	$1.08 day
Television: Color	0.18 kWh/hour	2 ¢ hour
Water heater (family of 4)	3.8 kWh/hour	67 ¢ hour

** www.cityofames.org and www.howstuffworks.org*

The formula for creating these figures is the number of watts of the appliance divided by 1,000 multiplied by the average Philadelphia electric rate of 15 cents per kWh.

Based on standard U.S. Government tests

ENERGYGUIDE

Refrigerator/Freezer
With Automatic Defrost
With Side-Mounted Freezer
With Through-the-Door Ice Service

1

2

XYZ Corporation
Model 28C-W
Capacity 23 Cubic Feet

Compare the Energy Use of this Refrigerator with Others before You Buy.

This Model Uses

776 kWh/year 3

Energy Use (kWh/year) range of all similar models

Uses Least Energy 742 4

4 Uses Most Energy 836

kWh/year (kilowatt-hours per year) is a measure of energy (electricity) use. Your utility company uses it to compute your bill. Only models with 22.5 to 24.4 cubic feet and the above features are used in this scale.

Refrigerators using more energy cost more to operate.
This model's estimated yearly operating cost is:

$116 5

Based on a 1992 U.S. Government national average cost of 24c per kWh for electricity. Your actual operating cost will vary depending on your local utility rates and your use of the product.

Sample EnergyGuide label

SHOPPING FOR APPLIANCES

The cheapest appliance is not necessarily the most energy efficient. The long-term cost of running it may exceed the one-time higher price of the more-efficient model. When buying an appliance, consider:

1. Purchase price
2. Cost of repairs and maintenance
3. Operating cost

By law, appliances must meet basic energy conservation standards set by the U.S. Department of Energy. Look for the yellow EnergyGuide label when buying a new appliance. This label helps you compare appliances by listing their annual energy consumption and efficiency ratings.

If you don't see an EnergyGuide label, ask the sales-person for the information.

ENERGYGUIDE LABEL

Refer to the numbers in blue circles on the sample label at left:

❶ Information about features

❷ Manufacturer, model number, capacity

❸ Estimates of annual energy use. The lower the number, the more energy efficient and the less it will cost to run.

❹ Range of ratings for similar models from "uses least energy" to "uses most energy." This scale shows how a particular model measures up to the competition.

❺ An estimate of the yearly cost to run this model.

ENERGYGUIDE LABEL

*When shopping for a water heater, study the **EnergyGuide** label to see how much it will cost to run.*

PHILADELPHIA HOUSING DEVELOPMENT CORPORATION

WEATHERIZATION MANUAL

TAKE THE ENERGY QUIZ

ENERGY USE QUIZ

Q1:

WHAT USES MOST ENERGY?

Write a number in each box from 1 (most energy) to 4 (least energy).

RUNNING APPLIANCES

HEATING WATER

HEATING YOUR HOME

LIGHTING YOUR HOME

A ☐ B ☐ C ☐ D ☐

Q2:

ELECTRIC METER READING

Write the correct meter reading in the yellow box.

84266 73256 74257

☐

Q3:

WHAT USES THE MOST HOT WATER?

Write a number is each box from 1 (most energy) to 5 (least energy).

A. Clothes washer ☐

B. Bath ☐

C. Shower ☐

D. Handwashing dishes ☐

E. Dishwasher ☐

Q4:

TEST YOUR KNOWLEDGE

Check "yes" if the statement is correct; "no" if it's wrong.

	YES	NO
A. You use more energy in April than in January.		
B. Your energy bill will be lower in September than in February.		
C. Your most expensive bill will be for January.		
D. Your cheapest energy bills will be in April and September.		
E. You really need to conserve energy in January.		

DO YOU KNOW?

How much you pay for energy each year_____

The condition of your roof

_____

The temperature setting of your hot water heater _____

How to clean/change your furnace filter_____

Where your thermostats are located

_____

Your use of CFLs

_____

Where to go for energy help

_____

Q5:

HOW DOES AIR ENTER A HOME?

Write a number in each box to show the highest (1) to the lowest (7) ways air enters your home.

A. Doors ☐

B. Fans and vents ☐

C. Ceilings, walls, floors ☐

D. Windows ☐

E. Plumbing ☐

F. Electric outlets ☐

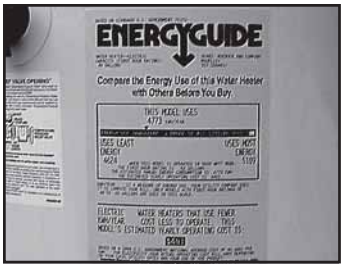
G. Ducts ☐

ENERGY USE QUIZ

Q6:

WHAT IS THE ENERGYGUIDE LABEL?

In the gray box, write the letter of the answer that describes what the yellow EnergyGuide label tells you about an appliance.



A. The current sales price

B. The energy it uses and the cost to run it for a year

C. How to save energy

D. Consumer guide rating

Q7:

SAVES OR WASTES ENERGY?

Check which activity saves energy and which wastes it.

	SAVES	WASTES
A. Open the oven door to check food.		
B. Ignore the worn seal on the refrigerator.		
C. Take 5-minute instead of 15-minute showers.		
D. Keep freezer compartment full.		
E. Leave shades and drapes open at night in winter.		
F. Wash a full load of laundry in cold water.		
G. Use fans instead of the air conditioner.		

ANSWERS:

Q1:
A=3, B=1, C=2, D=4

Q2:
73256

Q3:
A=2, B=5, C=1, D=3, E=4

Q4:
A=No, B=Yes, C=Yes, D=Yes, E=Yes

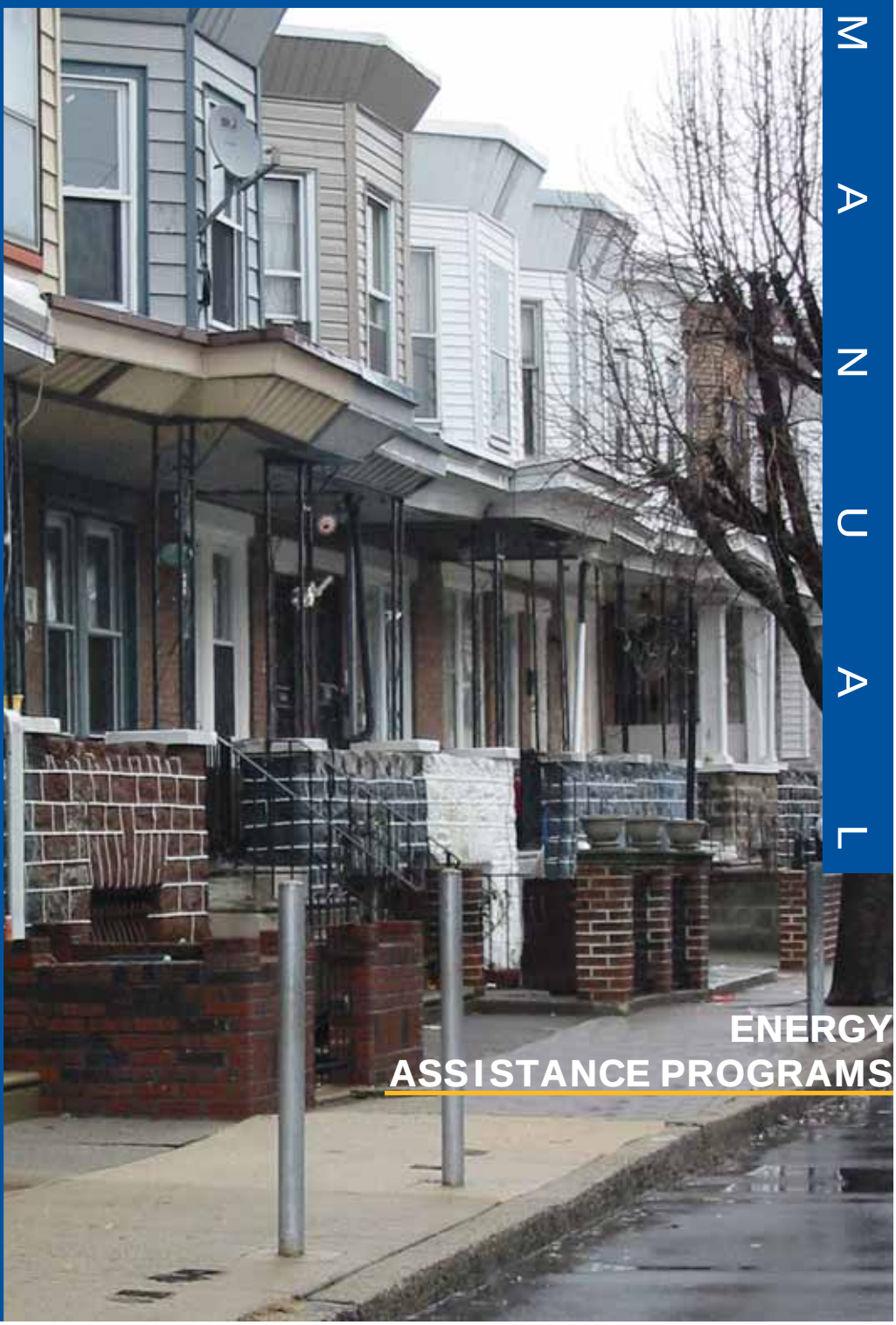
Q5:
A=4, B=6, C=1, D=5, E=3, F=7, G=2

Q6:
B

Q7:
A=Wastes, B=Wastes, C=Saves, D=Saves, E=Wastes, F=Saves, G=Saves

WEATHERIZATION MANUAL

PHILADELPHIA HOUSING DEVELOPMENT CORPORATION



ENERGY ASSISTANCE PROGRAMS

ASSISTANCE PROGRAMS

ENERGY ASSISTANCE PROGRAMS

CRISIS Grant (Emergency Fuel Assistance Program)

A federal CRISIS grant can help homeowners and tenants pay for heating, including oil deliveries, in an emergency. Applicant must be without oil; at risk of termination of heating service or service has already been shut off. Call 215-686-2590.

Home Energy Loan Program (Mini-PHIL)

Philadelphia owner-occupants with less-than-perfect credit may be eligible to borrow up to $10,000 for energy related improvements to their home. Call 215-523-9520 or visit www.formyphillyhome.org.

LIHEAP

The Low Income Home Energy Assistance Program (LIHEAP) is a federally funded program administered by the state to help low-income households pay for home-heating bills. Applicants do not have to be on public assistance. Grants are available for both homeowners and renters. Call 215-560-2970.

Utility Emergency Services Fund (UESF)

This fund provides cash to help low-income households pay heat-related bills. You must have a shut-off notice or are in danger of being shut off. You must have applied for and exhausted all available governmental energy-assistance programs. Call 215-829-0545.

Weatherization Assistance Program (WAP)

Pennsylvania's Weatherization Assistance Program (WAP), administered in Philadelphia by PHDC, provides weatherization and energy conservation services at no cost to low-income renter and homeowner households. WAP reduces household energy use and costs by improving the energy efficiency of a participant's home. Call PHDC at 215-448-2160.

Cold weather puts a huge strain on household budgets. Check out the assistance programs but note that they all have eligibility guidelines.

PGW Customers

may apply for grants at the following offices, 9 a.m. until 5 p.m., on the designated days:

Center City

1137 Chestnut St.
Monday, Tuesday, Thursday & Friday

Frankford

4410 Frankford Ave.
Tuesday, Thursday & Friday

Germantown

210 W. Chelten Ave.
Tuesday, Wednesday & Friday

North Philadelphia

1334 W. Erie Ave.
Monday, Wednesday & Thursday

South Philadelphia

1601 S. Broad St.
Monday, Wednesday & Thursday

West Philadelphia

5230 Chestnut St.
Monday - Wednesday & Friday

PGW North Central Customer Service Center

1800 N. 9th St.
Open for LIHEAP applications only
Tuesday through Thursday.

Northeast Philadelphia Community Outreach Vehicle

Castor Avenue & Hoffnagle Street
PGW will take applications
9 a.m. until 4 p.m.
Tuesday through Thursday.

PHILADELPHIA GAS WORKS (PGW)

PGW offers these programs:

Conservation Works Program (CWP)

CWP helps low-income customers reduce energy usage and make energy bills affordable. It's targeted to households whose gas usage is average or above average and who are enrolled in CRP. All CRP participants are automatically placed on a waiting list to receive CWP services and are contacted when their account is selected. No additional application is necessary.

Call 215-235-1000.

Customer Assistance Referral and Evaluation Program (CARES)

CARES assists customers with special needs.

Call 215-235-1000.

Customer Responsibility Program (CRP)

CRP cuts bills about 50 percent for low-income customers. Gas service can't be cut off during winter. To apply, bring the Social Security cards and proof of income for everyone living in your household to a PGW service center.

Call 215-235-1000.

Senior Citizen Discount

PGW customers aged 65 or older before Sept. 1, 2003, may qualify for a 20-percent discount.

Call 215-235-1000.

ASSISTANCE PROGRAMS

PECO ENERGY

PECO offers these programs:

CAP Rate

CAP Rate offers four discounted residential rates to low-income electric and gas customers. The percentage of discount is based on the customer's gross monthly household income.

Call 1-800-774-7040.

Customer Assistance Referral and Evaluation Services (CARES)

CARES assists customers who have temporary personal or financial hardships that prevent payment of their utility bills.

Call 1-800-774-7040.

Low Income Usage Reduction Program (LIURP)

This free program can help homeowners and tenants lower the amount of gas and electricity used by installing weatherization measures and teaching conservation education.

Call 1-800-675-0222.

Matching Energy Assistance Fund (MEAF)

A customer-pledge program, MEAF assists low-income, residential customers with bill payment. PECO matches customers' pledges.

Call 1-800-774-7040.

ASSISTANCE PROGRAMS

HOME-HEATING OIL COOPERATIVES

Home-heating oil prices are soaring but you can save money by joining an energy cooperative. Co-ops have deals with oil suppliers for discounted prices and can save members from 10- to 20-percent on heating oil. Membership fees apply. In Philadelphia, contact:

The Energy Cooperative
1218 Chestnut St.
Suite 1003
Philadelphia PA 19107
215-413-2122
www.theenergyco-op.com

PIRG Fuel Buyers
1334 Walnut St.
5th floor
Philadelphia PA 19107
215-893-3835
www.pirg.org/fuelbuyers

ENERGY COORDINATING AGENCY OF PHILADELPHIA (ECA)

1924 Arch St.
Philadelphia, PA 19103
215-988-0929
www.ecasavesenergy.org

ECA provides a range of energy-bill payment assistance, education and conservation services including LIHEAP intake, CRISIS intake, UESF intake, PECO Customer Assistance Programs and emergency fuel oil grants.

Call ECA or visit the website for a list of neighborhood energy centers.

WEBSITES for reference:

www.doe.gov
U.S. Department of Energy

www.eere.energy.gov
U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy

www.dep.state.pa.us
(type in search word energy)
The Pennsylvania Office of Energy and Technology is part of the Department of Environmental Protection.

www.phila.gov
City of Philadelphia website

www.phila.gov/ohcd
City of Philadelphia's housing website

www.hud.gov
Links to sites for consumer protection and product safety information

www.epa.gov/energystar
Energy Star site

www.exeloncorp.com
Exelon Corporation
(PECO gas and electricity) site

www.pgworks.com
Philadelphia Gas Works site

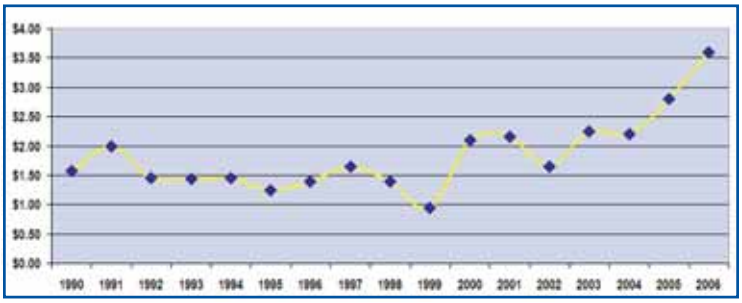
ENERGY PRICES

Home-heating prices have increased substantially since the year 2000. The Low Income Home Energy Assistance Program (LIHEAP) helps cover the cost of home heating and cooling bills for 5 million very poor households, including many low-income elderly individuals, but its budget has not kept pace with rising energy costs.*

The following statistics** are from the Energy Information Administration (EIA), a division of the U.S. Department of Energy which updates oil prices on a weekly basis.

U.S. Residential Heating Oil Prices

(Dollars per Gallon)



U.S. Natural Gas Residential Prices

(Dollars per Thousand Cubic Feet)

Month	2005	2006
Jan	$11.00	$14.92
Feb	10.98	13.99
Mar	10.95	13.10
Apr	11.98	13.26
May	12.83	14.37
Jun	13.88	14.96
Jul	14.96	15.63
Aug	15.62	16.12
Sep	16.66	
Oct	16.53	
Nov	15.82	
Dec	14.71	

Pennsylvania Electricity Prices

(Cents per kWh)

Month	2005	2006
July	10.47¢	11.10¢

Solar panels on a new house on Reinhard Street enable the owner to sell excess electricity back to the electric company.

* *www.cbpp.org/10-6-05bud-pr.htm*

** *www.eia.doe.gov*

MAINTENANCE SCHEDULE

MONTHLY

Item	Inspection	Notes/Date
AIR CONDITIONER	Clean filter, remove leaves and debris.	
CLOTHES DRYER	Clean lint screen after each use and duct annually.	
DRAINS	Check for leaks.	
FURNACE FILTER	Inspect filter. Clean or replace if necessary.	
WATER SUPPLY LINES	Check pipes for leaks.	

SPRING

Item	Inspection	
AIR CONDITIONER	Remove cover, check filter	
ATTIC	Check rafters and roof sheathing for condensation.	
BASEMENT	Check all surfaces for pooling water and damage.	
EXHAUST FANS	Clean filters to maximize air flow.	
GUTTERS	Clean gutters and downspouts. Check for leaks.	
INSULATION	Add insulation where insufficient.	
ROOF	Inspect for damage, check flashing.	
WEATHERSTRIPPING	Check around doors, windows for drafts.	

SUMMER

Item	Inspection	
BRICK WALLS	Check for cracks and broken stucco.	
WINDOWS	Check for drafts in areas you air condition.	

FALL

Item	Inspection	
EXHAUST FANS	Clean filters, grills, blades.	
FURNACE	Check filter, clean out and tune up if necessary.	
GUTTERS	Clean, check loose connections and joints.	
HEAT REGISTERS	Vacuum to maximize heat flow.	
RADIATORS	Bleed all radiators.	
WATER HEATER	Flush tank to remove sediment.	
WEATHERSTRIPPING	Check around doors, windows for wear, drafts.	

WINTER

Item	Inspection	
DAMPERS	Adjust to target specific rooms for the season.	
FURNACE	Check filter monthly.	

Weatherization Assistance Program
U.S. Department of Energy (DOE)

DOE's Weatherization Assistance Program works with states and local governments to enable low-income families to permanently reduce their energy bills by making their homes more energy efficient.

Pennsylvania Department of Community and Economic Development (DCED)

DCED funds the online training program for participants in the Pennsylvania Weatherization Assistance Program.

A C K N O W L E D G M E N T S

The material in the *Philadelphia Housing Development Corporation Weatherization Manual* is based on technical research by Dana Sylvester and the late Robert Turner, Weatherization Assistance Program, PHDC; editing by Emilymarie Romin, Public Information, Philadelphia Office of Housing and Community Development (OHCD); writing, design and photography by Jane Whitehouse, Tiger Productions. This publication was based on material from the online training program for participants in the Pennsylvania Weatherization Assistance Program funded by the Pennsylvania DCED and on material from the U. S. Department of Energy. Printing funded by DCED.

This publication is dedicated to the memory of Robert Turner, Housing Rehabilitation/Weatherization Energy Efficiency Specialist Supervisor (1959 - 2006) whose contributions to this program were invaluable.

PHILADELPHIA HOUSING DEVELOPMENT CORP.

1234 Market St., 17th Floor
Philadelphia PA 19107
215-448-3000
Anthony C. McIntosh, Executive Vice President

City of Philadelphia, John F. Street, Mayor

PHDC has been serving the housing needs of Philadelphians since 1965.

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