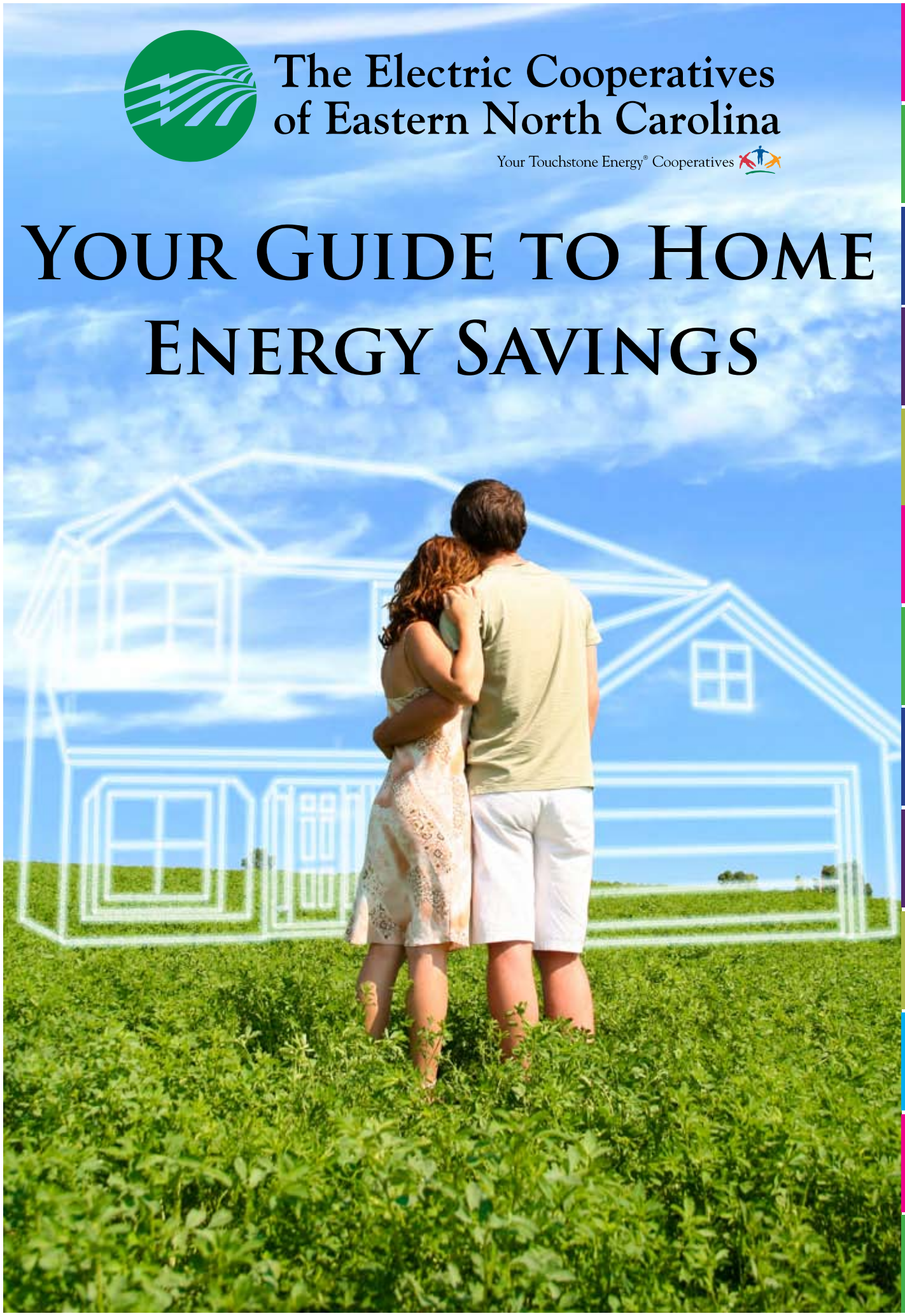
The Electric Cooperatives of Eastern North Carolina

Your Touchstone Energy® Cooperatives

Your Guide to Home Energy Savings



- Energy Analysis
- Air Infiltration
- Heating & Cooling
- HVAC Hiring Tips
- Water Heating
- Lighting
- Major Appliances
- Windows
- Phantom Power
- Manufactured Homes
- Energy Star
- Low & No Cost Tips
- NC GreenPower

Rising costs...
Resource allocation...
Increasing demand...
Environmental mandates...

There are plenty of good reasons to take control of your energy lifestyle.

Does that mean you have to sacrifice comfort and convenience? Not at all. In fact an energy efficient home is more comfortable, more affordable and can even be more healthy. Just think of it as doing more with less.

This publication is intended to help you learn more about your personal energy use and where savings opportunities exist. Most often you'll find that the best ways to save energy cost little or nothing to implement.

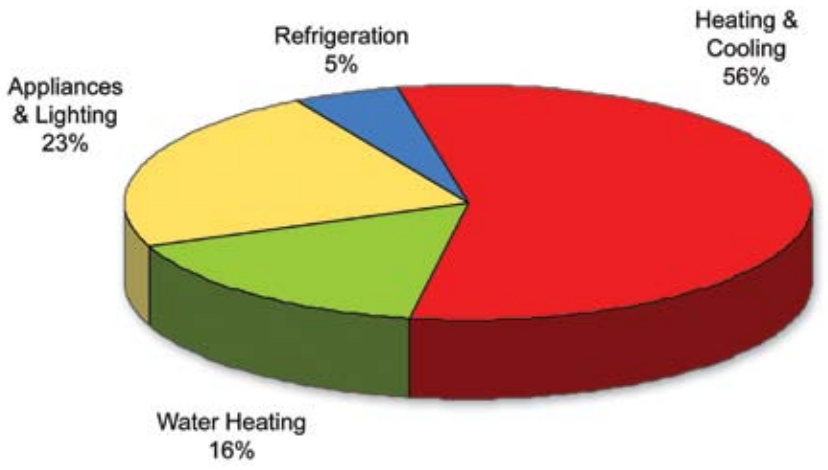
Most importantly we hope this publication makes you a more informed consumer especially when you are in the market for a new heating and cooling system or home appliances. What you buy today will determine your energy costs for years to come.

Sincerely,
The Electric Cooperatives of Eastern North Carolina

ANSWERING WHAT, WHERE, WHEN AND WHY

When adjusted for inflation electric rates are less today than we were 45 years ago. However, the average home uses 6 times more electricity than it did in 1960. So how is all that residential energy being used?

Obviously space heating and cooling consume the greatest portion of residential energy dollars. That's why home heating and cooling offer the best potential for energy savings.



Water heating is generally the second largest single energy user.

Increasingly problematic however is the appliances & lighting category which includes common household items such as oven, stoves and microwaves but is expanding to include cell phone chargers, pool pumps, hot tubs and scores of new consumer goods. And another energy issue to be increasingly aware of is phantom power: More and more of the electronics and appliances we buy today use energy while not in active use. Bit by bit, kilowatt hour by kilowatt hour, it all adds up.

Complete exercises 1 and 2 to determine WHAT your energy consumption actually is, WHERE it is being used, WHEN you consume the most energy and WHY you use the energy you do. Once you've completed the worksheets you'll be ready to learn HOW you can live a more comfortable, affordable and energy efficient lifestyle.

Here's an easy way to check your home's electrical system for power losses:

1) Cut the main breaker off; check your electric meter a few minutes later and make sure it comes to a complete stop. If not, call your power provider.
2) Cut all the individual breakers off then cut the main back on. Make sure the meter is still off. If not, call an electrician to check your home's wiring.

Exercise #1: Where does my energy go?

WHERE DOES MY ENERGY GO?

The following exercise will help you obtain a fairly accurate idea of your base energy consumption and your home heating and cooling expenses. If you heat with gas, oil or any other non-electric method please contact your home heating energy provider to obtain billing information.

Step 1: Obtain your annual energy readings and expenditures. Most electric cooperatives provide a detailed graph showing energy use for the past 12 month period.

Step 2: Find the three months with the lowest consumption. Drop the lowest month. Average the remaining 2 months. This is your base consumption minus heating and cooling expenses.

Step 3: Subtract the base consumption from each of the remaining months.

Step 4: Add the amount you spent ABOVE the base consumption in winter. This is your estimated home heating expense.

Step 5: Add the amount you spent ABOVE the base consumption in summer. This is your estimated home cooling expense.

BASE CONSUMPTION _____

HOME HEATING _____

HOME COOLING _____

Exercise #2: Daily Meter Readings

METER READING CHART

A great way to learn about your energy usage patterns is to keep a daily meter reading chart. Fill in your meter readings every 24 hours. Note the day's average temperature. Remember to note any unusual or significant activities such as multiple loads of laundry, baking or hot tub use.

KWH Reading	Water Reading	Gas Reading	Average Temp	Unusual/Significant Activities

THE BEST DEFENSE IS A GOOD OFFENSE

We've already determined that heating and cooling generally consume the largest percentage of our home energy dollars. The first step towards heating and cooling efficiency and increased comfort within your home is to keep conditioned air in and unconditioned air out. That means establishing a good thermal barrier.

CRAWLSPACE/FLOOR

- **Ensure proper grading prior to construction to keep water from entering the crawlspace or damaging the slab due to poor drainage**
- **Install an adequate vapor barrier that covers all ground surfaces and is well bonded to the foundation walls with mastic which is a durable, adhesive paste**
- **Restrict access to the crawlspace to prevent torn ductwork and displacement of floor insulation**
- **Make sure all plumbing and utility penetrations are caulked and sealed; tell contractors they own the holes they make and must seal them up to stop air infiltration**
- **We highly recommend completely sealed crawlspaces which are now allowed by North Carolina building code. For more information visit www.crawlspaces.org**

ROOF/ATTIC

- **Use the lightest colored roof shingles possible to minimize solar gain**
- **Minimize the use of recessed lighting and only install Energy Star rated fixtures**
- **Verify that insulation coverage is thorough and consistent throughout the attic**
- **Make sure your attic access is well insulated to prevent conditioned air from being pulled into the attic**
- **Avoid the use of powered attic ventilators**

WALLS

- **Walls usually represent more total exterior surface than floors & ceiling so good insulation is a must**
- **Insulation should fit snuggly between studs; faced insulation should be stapled to the edges of the wall studs**

DID YOU KNOW?

The typical home has enough air leaks to equal two open windows year round! These air leaks include plumbing and wiring penetrations, fireplace dampers, chimneys, attic access hatches, recessed lights, electrical outlets and switches on exterior walls, windows, doors, baseboard moldings, dropped ceilings, and kneewalls in finished attics. Caulk is best for cracks up to ¼". Select a high quality caulk that will remain flexible. Use expanding foam for larger gaps. Weatherstrip windows and doors.

Insulation is all about installation

What type of insulating material do we recommend? One that's installed properly and meets building code.

The key lies in thickness, uniformity and uninterrupted coverage. Problem areas generally include tray or cathedral ceilings, attic eaves, recessed lighting receptacles, built ins such as alcoves and bookcases, and underneath bathtubs.

It is easy to verify proper insulation levels with a ruler.

Minimum R-Values Recommended for North Carolina

ATTIC: R-49
CATHEDRAL: R-38
WALL: R-18
FLOOR: R-25
CRAWLSPACE: R-19
SLAB EDGE: R-8
BASEMENT: R-11

New Construction Checklist #1: Air Sealing & Insulation

Air sealing

Before drywall is installed:
o Seal bottom plate of exterior walls during construction
o Seal inside edge of bottom plate after exterior walls are erected
o Air seal behind bathtub before setting and after insulation is installed using plastic, drywall, or other sheet material
o Seal windows and exterior doors into rough opening using spray foam or backer rod
o Seal wiring, plumbing, and HVAC penetrations at top and bottom plates, ceilings, and floors

After drywall is installed:
o Seal bathtub drain penetration after installation and before floor insulation is installed
o Seal plumbing pipes and electrical boxes (e.g., receptacles, switches, lights, and circuit breaker box) to drywall
o Seal bathroom ventilation fan to drywall
o Seal attic bypasses and chases (e.g., open partition walls, dropped ceilings, and duct and flue chases)
o Caulk, glue or gasket drywall
o Seal duct boots to floor or drywall
o Verify that the HVAC contractor has sealed return and supply duct connections (mastic required)
o Seal exterior penetrations (e.g., porch light fixtures, outside outlets, and phone and electric service holes)
o Weatherstrip attic access hatch cover

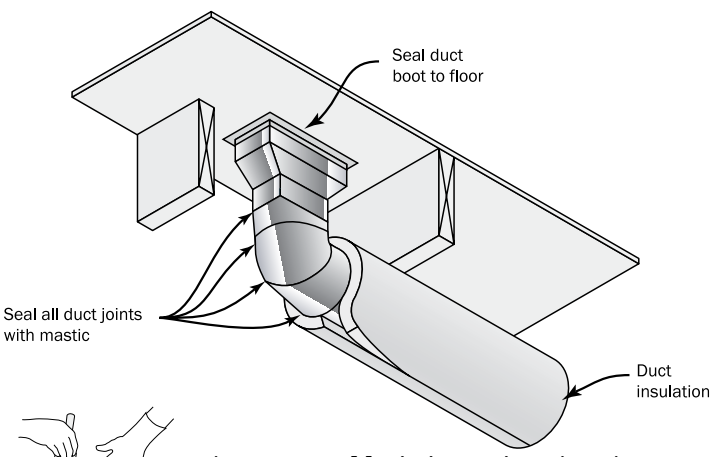
Insulation

o Use insulation hangers (rods) placed every 12 inches to hold floor insulation in place
o Use energy efficient framing (e.g., energy corners, T-walls, insulated headers) to improve coverage
o Carefully staple kraft paper facing of wall insulation batts to side of stud or front (preferred) to avoid compressing batts
o Cut, don't cram, wall insulation batts to fit around wiring, wall outlets, and plumbing
o Install soffit dams and rafter baffles to provide clearance for soffit ventilation
o Insulate attic access hatch cover or construct cover for attic stairs from rigid foam insulation

Communicate with your contractor; It is up to you to establish energy efficiency as a top priority

Deductive reasoning

On average, homes in North Carolina lose 15% of their heated or cooled air through the duct system. The shame of it is that it's such an easy problem to avoid. When possible locate ductwork inside conditioned space. If that's not possible then it is critical to properly seal and insulate them. Insist that your contractor seal all ductwork with mastic - a thick paste that provides a durable, lasting seal. Duct tape does NOT provide a lasting seal and should not be used.



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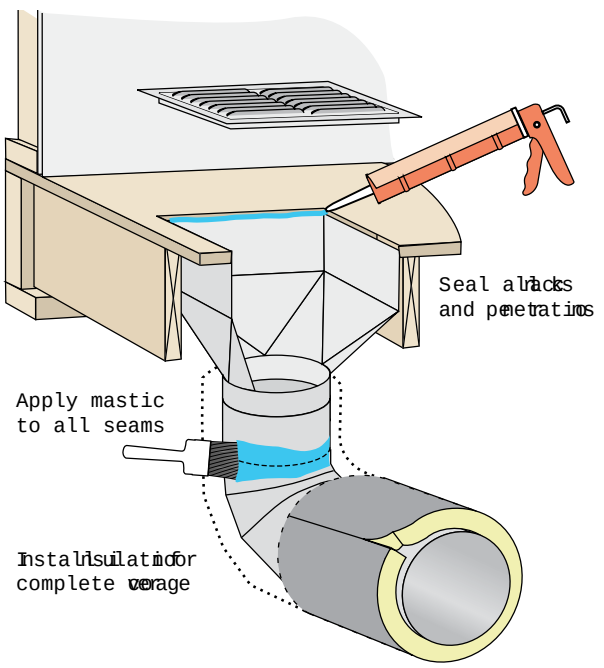

Technical drawings courtesy of Southface Energy Institute

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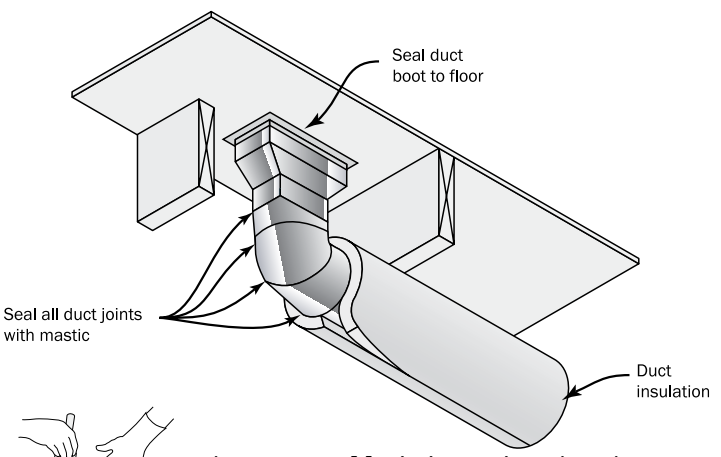

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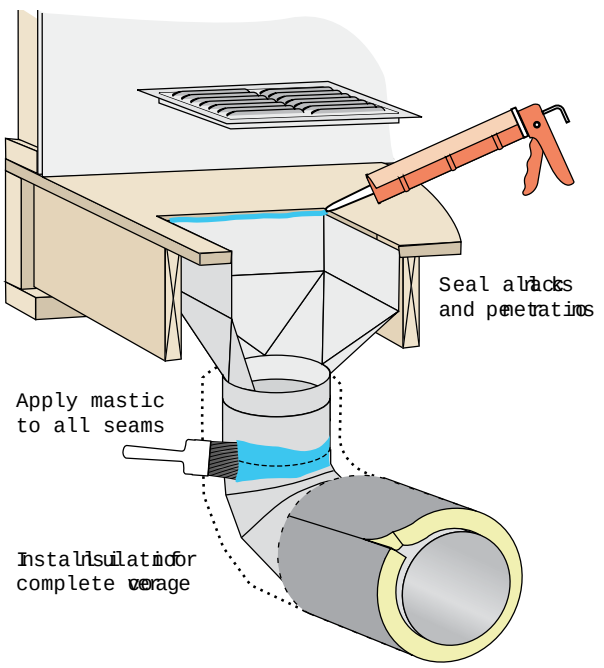

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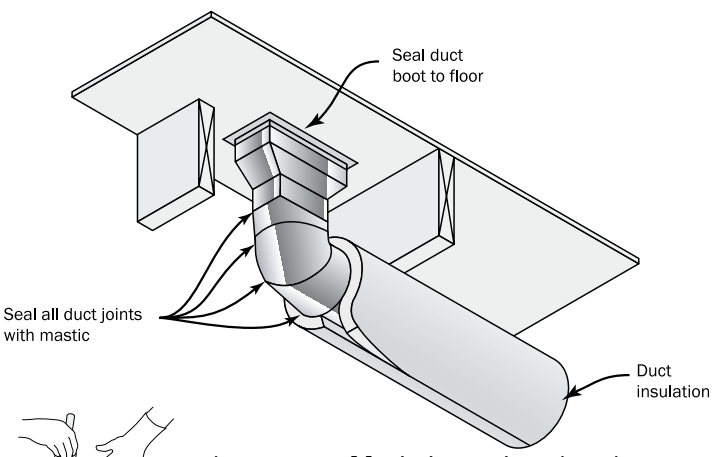

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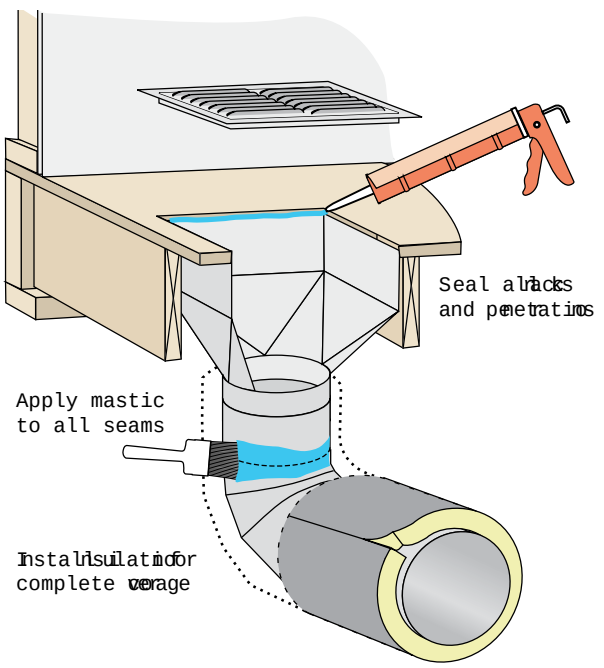

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Guide To Sealing Ductwork: Plenum Connections

Mastic: The key to tight ductwork

Duct tapes lose their adhesiveness over time and do not provide a permanent seal. That's why ducts should be sealed with mastic. Mastic is a thick paste and can be used on all duct materials providing a permanent seal. Mastic comes in tubs and tubes and costs about $10 per gallon.

Just say "no" to duct tape

1

Apply mastic to collar at plenum

2

Apply mastic to collar before flex

3

Attach flex duct and zip tie

4

Apply mastic to connection

5

Insulate collar to code

6

Seal all plenum seams with mastic

7

Use mastic and fiberglass mesh tape to connect plenum to air handler

Gudie to Sealing Ductwork: Boot Connections

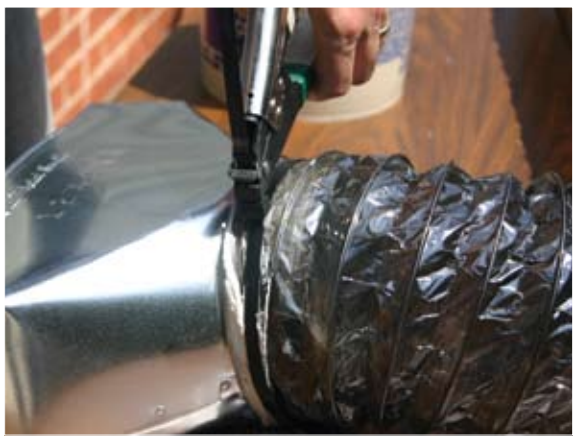
1

Apply mastic to boot

2

Pull liner onto boot

3



Install zip tie

4

Apply mastic to connection

5

Insulate boot to code

6

Seal interior seams of boot

7

Seal exterior seams of boot

8

Seal boot to subfloor or sheetrock

Materials courtesy of:
Advanced Energy Corporation
909 Capability Drive, Suite 2100
Raleigh, NC 27606-3870
1-919-857-9000
www.advancedenergy.org

Selection and Installation

Selecting a properly sized heating and cooling system is one of the most important energy decisions you'll ever make. Size is determined by the heating and cooling load. Yes, living space plays a role in determining the load but if a contractor wants to size the unit based on square footage alone please move on and find another contractor. A reputable dealer with your best interest in mind will perform a load calculation as required by North Carolina law. Most warranties also stipulate that the system be properly sized prior to installation.

A heat loss/heat gain calculation takes into account all the energy characteristics of your home including square footage, ceiling heights, insulation, the number of occupants and total glass area. Do not pressure your dealer to oversize the unit. Oversized cooling systems short-cycle and fail to remove adequate amounts of humidity from your home. Short-cycling can also lead to premature unit failure and will result in higher utility bills. Follow the guidelines listed below to make sure your HVAC unit is a perfect fit.

1. Get more than one written estimate. Each estimate should include a heat loss/heat gain calculation. North Carolina state law requires all HVAC contractors to use this method to properly size a heating and cooling system for your home. Unit size is expressed in tons. ASK FOR A COPY OF THIS REPORT BEFORE YOUR CONTRACTOR PROCEEDS ANY FURTHER!

2. Select a reputable HVAC contractor that you feel comfortable working with. Make sure they carry the required licenses and insurance before they begin work. Choose a contractor that offers routine maintenance and repair service in your area.

GEO FACT:
Every 100,000 homes with geothermal heat pump systems reduce foreign oil consumption by 2.15 million barrels annually and reduce electricity consumption by 799 million kilowatt hours annually.

3. If the installation will include new or additional duct work make sure your contract stipulates that all joints, boots and returns will be sealed with mastic. If you will be using existing duct work it is worth the few extra dollars to have your contractor inspect it thoroughly before installation of the new unit. One in three homes has at least one disconnected duct.

4. Next, you will need to determine the type of unit that will best fit your needs. In most cases we recommend installing an energy efficient heat pump to heat and cool your home. A heat pump does just that. In the winter, it extracts outdoor heat and pumps it into your home. In the summer, it removes indoor heat and pumps it outside. One unit does it all.

There are 2 basic types of heat pumps: air to air and geothermal. Air to air heat pumps have the lowest installation cost and when properly designed produce winter airflows of 90 + degrees Farenheit. Because heat pumps are designed for comfort, air to air heat pumps may be equipped with auxillary heat in the event that temperatures dip below normal design limits.

On the other hand, geothermal heat pumps use the free solar energy of the earth itself to provide heat in winter. These units do not require auxiliary heating. In the summer, geothermal units can even provide free hot water. Geothermal heat pumps cost 2 to 3 times more to install than an air-to-air heat pump. However, they have the lowest maintenance costs of any unit on the market today and generally last 20 to 30 years. The increased energy savings will pay for the additional costs in the first 3 to 5 years of operation.

5. The next step in the process is to select the efficiency rating of your unit. All air conditioning equipment receives a SEER (Seasonal Energy Efficiency Rating) rating that documents how efficient the unit is during the cooling mode. The higher the SEER, the more efficient the cooling product. The U.S. Government's minimum allowable efficiency level is 13 SEER. Heating components are assigned an HSPF (Heating Seasonal Performance Factor) rating. Again, the higher the HSPF, the more efficient the heat pump's heating performance. Federal law prohibits the sale of heat pumps with a HSPF rating less than 6.85. Although it is important to purchase the most efficient HVAC equipment your budget will allow it is even more important that all equipment be installed properly using mastic for sealing connections. A properly designed and installed duct system enables the unit to operate at its optimum efficiency.

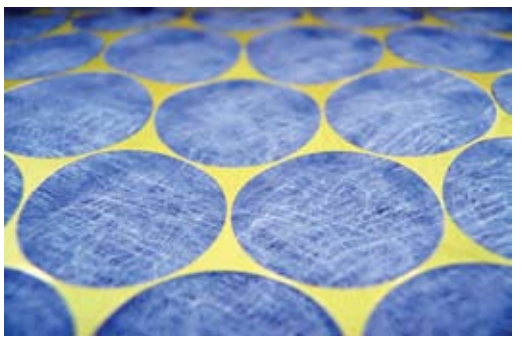
6. Inspect your installed HVAC equipment to ensure the installation was performed as outlined in your contract. The dealer should show you and your family how to operate the thermostat and how to properly replace system filters. Have a qualified technician perform a blower door or duct blaster test on your home to verify duct leakage is kept at a minimum and to help locate high infiltration areas that need to be addressed.

Operation and Maintenance

Once your HVAC system has been installed and inspected, it's time to learn how to operate and take care of it properly.

1. Read your owner's manual. Familiarize yourself with the terms and conditions of your warranty.

2. Thermostats should be installed on an inside wall near the center of the heating and cooling zone. Avoid installing thermostats near doors or windows that radiate heat or produce drafts which could cause the unit to run excessively or not enough. A digital thermostat provides the ability to more easily read and set the desired temperatures for the cooling and heating modes. Thermostats have varying degrees of accuracy so you should keep in mind that there can be some minor differences between the actual room temperature and the setting on your thermostat.



Many digital thermostats also have the ability to be programmed to automatically increase or decrease the room temperature based on the time of day or even the day of the week. While these devices can be very convenient, you can accomplish the same results with a non-programmable unit as long as you remember to reset the thermostat to the desired temperature. Verify that the thermostat is set to AUTO and that it is also set to the appropriate mode of operation (heating or cooling).

A thermostat setting of 75 degrees or higher is recommended for summer, and a setting of 68 degrees or lower is recommended for winter. A WORD OF CAUTION: Increasing the thermostat setting more than 2 degress on heat pumps during the heating mode can cause the auxiliary heat to operate. The energy your heat pump consumes while in auxiliary or emergency heat mode is quite expensive. So when it comes to your heat pump's thermostat during heating season just "SET IT AND FORGET IT"!

3. Make sure air filters have been installed in all of your return air registers. Depending upon the size and layout of the living space your HVAC system may have more than one return-air grille. Filters should be checked monthly and replaced as needed. Make sure you install the filter properly by making note of the air flow arrow on the filter. Unless the HVAC equipment manufacturer specifies a high efficiency filter element for your system, you should purchase inexpensive, non-pleated type filters and change them regularly. Clogged filters can shorten the life of some system components as well as decrease efficiency and increase

the cost to condition your home.

4. Do not obstruct return air registers with furniture or other items that will restrict the flow of air back to the system. If the system sounds like it's whistling then you probably have a return air problem.

5. Do not obstruct air flow from supply registers with furniture or other objects. Do not close individual room air registers. Blocking supply registers will decrease energy efficiency and the life of your equipment. Closing room air registers can also create duct leakage.

6. Keep all interior doors open during system operation. A closed interior door restricts airflow from reaching your return and puts a strain on the HVAC equipment. To find the air it needs the unit will pull unconditioned outside air into your home and energy costs will rise.

7. Keep the area around your outside condenser coils free from grass and other debris. If your clothes dryer vent is within 3 feet of the outside condenser unit, consider moving it to avoid clogging of the unit with dryer lint.

8. Have a licensed HVAC technician inspect and clean your condenser and evaporator coils annually.

Example of a Heat Loss Heat Gain Calculation Report

Residential Heat Loss and Heat Gain Calculation
In accordance with ACCA Manual J

Report Prepared By: Edgecombe-Martin County EMC

For: Sample 1600 sq. ft. home
878 Hwy. 33 East
Tarboro, North Carolina 27886

Design Conditions: Rocky Mount, NC

Indoor:
Summer temperature: 73
Winter temperature: 68
Relative humidity: 55

Outdoor:
Summer temperature: 91
Winter temperature: 21
Summer grains of moisture: 113
Daily temperature range medium

Building Component	Sensible Gain (BTUH)	Latent Gain (BTUH)	Total Heat Gain (BTUH)	Total Heat Loss (BTUH)
Whole House	**26,542**	**3,735**	**30,277 (2.5 tons)**	**39,795**
First Floor	26,542	3,735	30,277	39,795
All Rooms	26,542	3,735	30,277	39,795
Whole House	**26,542**	**3,735**	**30,277**	**39,795**

The report above is an example of a heat loss/heat gain report that HVAC contractors are required to perform when sizing a unit in North Carolina. You will notice that this particular report states the total heat gain is 30,277 BTU/H. With one (1) ton equalling 12,000 BTU, the report indicates that there is approximately 2.5 tons of heat gain for this home (30,277BTU/H/12,000 BTU's per ton = 2.5 tons). Therefore, for this particular home a 2.5 to 3 ton unit should be installed to ensure it is properly heated and cooled year round. It is important to remember that all homes are built differently and a home of the same size as this home could have extremely different heat loss and heat gain results. That is why it is imperative that your HVAC contractor evaluates your particular home in order to size the HVAC equipment appropriately. A heat loss/heat gain calculation evaluates various aspects of your home, from insulation in walls, floor and ceilings, windows, doors, shingle color, floor material, location of your home, brick or wood construction, and several other important factors needed to size your HVAC equipment accurately.

* BTU = British Thermal Unit (The amount of heat required to raise the temperature of one pound of water by one degree Fahrenheit.

Hiring an HVAC Contractor

Whether you want to schedule an annual equipment maintenance check-up or you've decided it's time to purchase a new heating and cooling system, you will need to hire a contractor.

A quality HVAC contractor should:

•Perform an on-site inspection and provide a detailed bid in a timely manner.

• Demonstrate to you that they have the proper licenses and insurance to repair and/or install heating and cooling equipment.

• Be able to provide their certification for handling refrigerant which has been required by law since 1992.

• Provide examples of quality installation of energy-efficient heating and/or cooling systems, with the names of customers that you can contact.

• Show you a layout of where the equipment is going to be installed: system and ductwork.

• Determine the size of your new equipment using ACCA/ANSI Manual J® or an equivalent sizing calculation tool.

• Inspect and repair your existing duct system before installing new mechanical equipment.

• Explain the warranty on equipment, parts, and labor.

• Clearly explain the benefits of regular maintenance and help you set up a schedule to keep your system operating at its best.

• List in detail all the work that is being contracted.

• Specify all products by quantity, name, model number, and energy ratings.

• State the scheduled start and completion date.

• Describe how disputes will be resolved.

• Outline paperwork and permits needed for the project.

Both you and your contractor should sign a written proposal before work starts.

HVAC Glossary of Terms

BTU: British Thermal Unit - The amount of thermal energy required to raise the temperature of 1 pound of water 1 degree Fahrenheit at sea level.

S E E R: Seasonal Energy Efficiency Ratio- A rating for central air conditioners. SEER10 is the minimum for new units manufactured after January1,1992.

Sensible Cooling Load- BTUs needed to be removed in order to lower the thermostat temperature independent of the BTUs related to humidity.

Latent Cooling Load- BTUs needed to be removed to lower humidity.

AFUE: Annual Fuel Utilization Efficiency- A laboratory derived efficiency for heating appliances which accounts for chimney losses, jacket losses, and cycling losses, but not distribution losses or fan/pump energy.

CFM: Cubic feet per minute- Unit used to express the air flow of fans or ducts.

Typical Life Cycle Costs of Three Central Heating Systems

System Type	Safety	Installation Cost	Operating Cost	Maintenance Cost	Life-cycle Cost
Combustion based	A concern	Moderate	Moderate to High	High	Moderate to High
Air-source heat pump	Excellent	Moderate	Moderate	Moderate	Moderate
Geothermal heat pump	Excellent	High	Low	Low	Low

Water Heating

Select a water heater with the highest energy factor (EF), the measure of a water heater's efficiency. The higher the EF, the more efficient the water heater. Electric-resistance water heaters have an EF ranging from 0.7 to 0.95; and heat-pump water heaters range from 1.5 to 2.0.

To properly size a storage water heater—including a heat pump water heater with a tank— for your home, use the water heater's first hour rating (FHR). The first hour rating is the amount of hot water in gallons the heater can supply per hour (starting with a tank full of hot water). Look for water heater models with a first hour rating that matches within 1 or 2 gallons of your peak hour demand—the daily peak 1-hour hot water demand for your home. (Complete Exercise #3 below).

TANKLESS WATER HEATERS

Tankless water heaters are a hot topic these days. These briefcase sized units use computer chips, high-power inputs, and an array of sensors to heat water only when the hot water tap is open. The water is heated very rapidly as it flows through a heat exchange coil.

Because tankless water heaters must heat water very fast, they have limited capacity and have difficulty supplying multiple hot water needs simultaneously. Therefore, a second tankless water heater may need to be installed if you plan on washing clothes while running the dishwasher and taking a shower.

Another factor to consider is the effect of the large load these units place on your electrical system. Residential tankless water heaters require 240

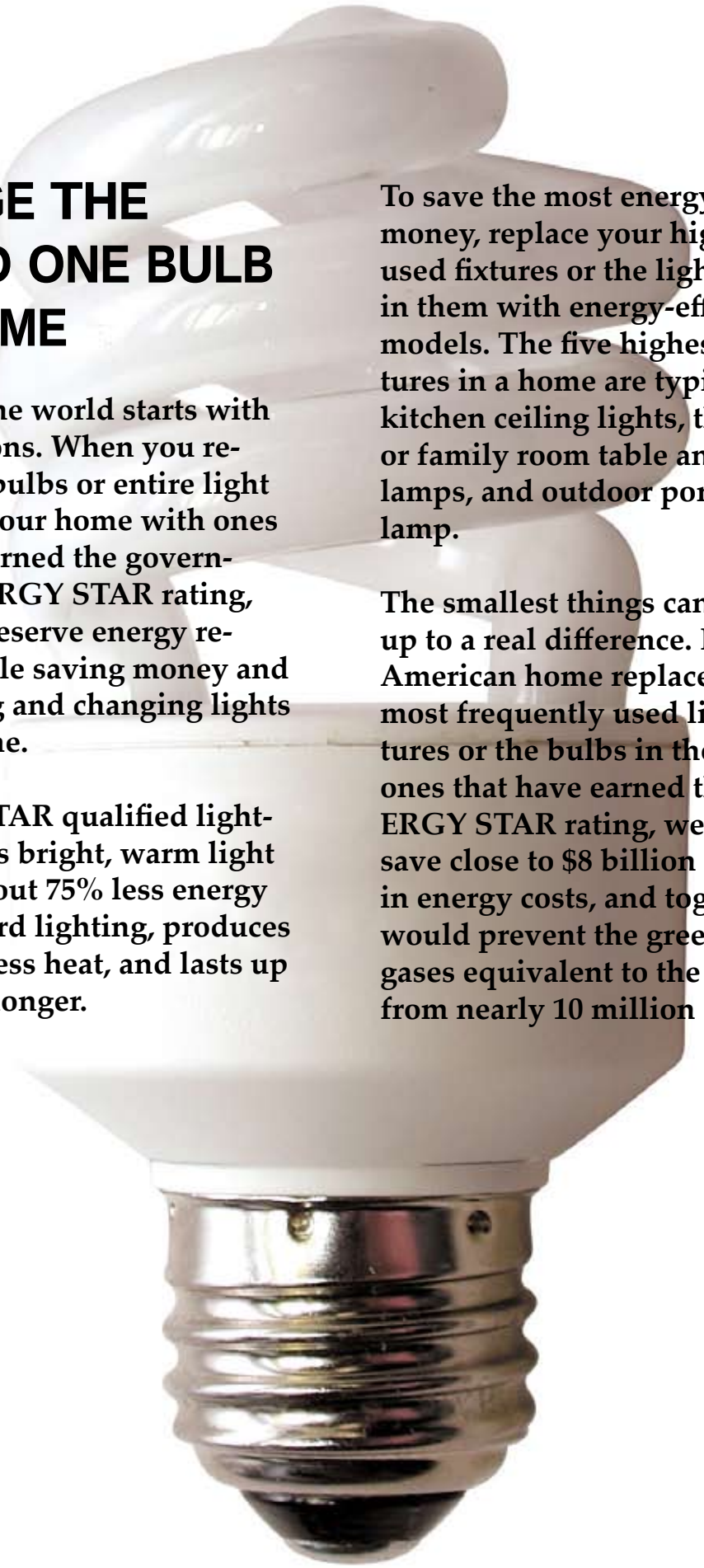
volts and up to 150 amps of capacity to operate. This level of demand exceeds that of most residential services. In addition to the cost of the heater, significant wiring upgrades could be required for your electrical system. In most instances, a transformer and service upgrade would be required if this type of load was added to your home. Contact your utility before purchasing this type of equipment to discuss possible construction costs to your residential service.

Exercise #3: Water Heater Sizing

Estimating Your Household's Peak Hour Demand (First Hour Rating)

Complete the following activity to determine the proper size water heater for your home. Base your answers on the hour of the day when the greatest hot water activity is likely to occur (usually morning or evening).

Use	Average gallons of hot water per usage		Times used during 1 hour		Gallons used in 1 hour
Shower	20	×		=	
Bath	20	×		=	
Shaving	2	×		=	
Hands & face washing	2	×		=	
Hair shampoo	4	×		=	
Hand dishwashing	4	×		=	
Automatic dishwasher	10	×		=	
Food preparation	5	×		=	
Top loading clothes washer	32	×		=	
Front loading clothes washer	16	x		=	
Total Peak Hour Demand				=	
EXAMPLE					
3 showers	20	×	3	=	60
1 shave	2	×	1	=	2
1 shampoo	4	×	1	=	4
1 hand dishwashing	4	×	1	=	+ 4
Total Peak Hour Demand				=	70 gallons



CHANGE THE WORLD ONE BULB AT A TIME

Changing the world starts with simple actions. When you replace light bulbs or entire light fixtures in your home with ones that have earned the government's ENERGY STAR rating, you help preserve energy resources while saving money and time buying and changing lights in your home.

ENERGY STAR qualified lighting provides bright, warm light but uses about 75% less energy than standard lighting, produces 75 percent less heat, and lasts up to 10 times longer.

To save the most energy and money, replace your highest used fixtures or the light bulbs in them with energy-efficient models. The five highest use fixtures in a home are typically the kitchen ceiling lights, the living or family room table and floor lamps, and outdoor porch or post lamp.

The smallest things can add up to a real difference. If every American home replaced their 5 most frequently used light fixtures or the bulbs in them with ones that have earned the ENERGY STAR rating, we would save close to $8 billion each year in energy costs, and together we would prevent the greenhouse gases equivalent to the emissions from nearly 10 million cars.

Federal Energy Incentives

The Energy Policy Act of 2005 offered tax credits to consumers and businesses that improved the energy efficiency of homes and workplaces. Portions of the Energy Policy Act have continued to be extended on a year by year basis.

To get the latest information on federal tax incentives visit:

www.energytaxincentives.org

State Energy Incentives

The Database of State Incentives for Renewables and Efficiency (DSIRE) offers the most up-to-date information for all 50 states including North Carolina.

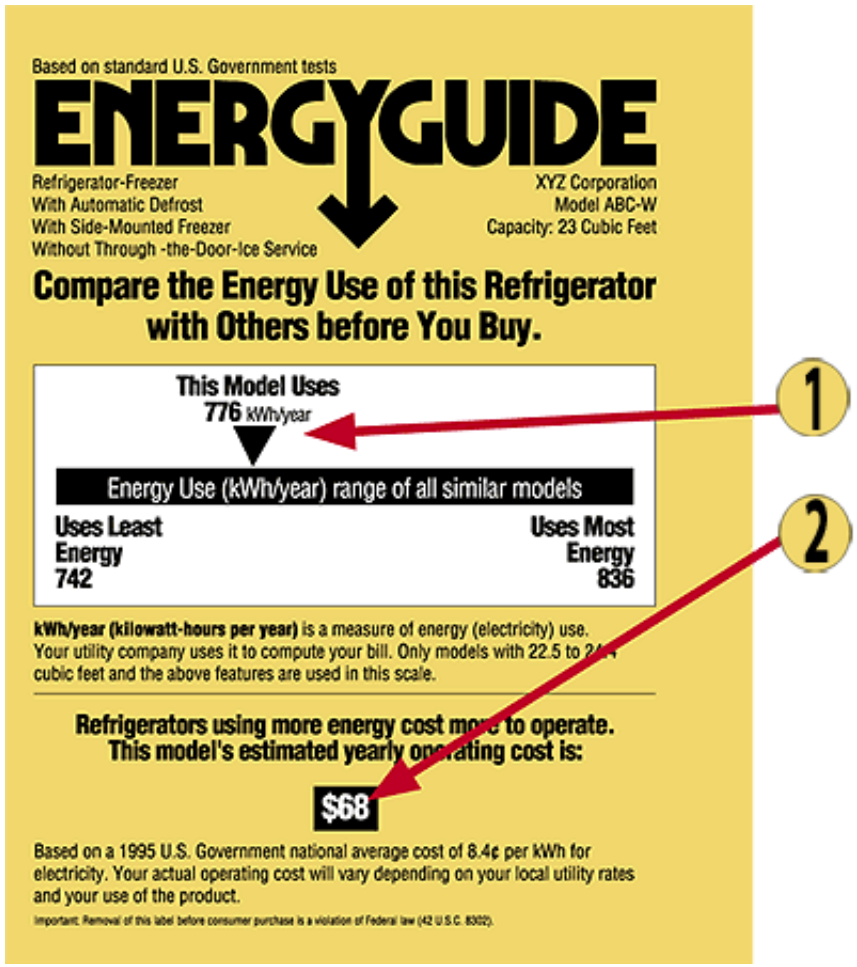
www.dsireusa.org

Major Appliances

LEFT IS RIGHT

When shopping for major appliances the U.S. Government has made energy comparisons quite simple with the ENERGYGUIDE label. All appliances are categorized and then ranked by energy use. To the left is the lowest category cost; to the right is the highest. In this case, the farther left you go the better off you are.

And Remember:
•Locate refrigerators away from heat producing appliances and direct sunlight
•Use energy saver settings on appliances whenever possible
•Reduce water heating costs by washing clothes in cold water



1:
Estimated energy consumption on a scale showing a range for similar models

2:
Estimated yearly operating cost based on the national average cost of electricity.

Phantom Power

When it comes to modern appliances, “off” is the new “on.” Almost all modern appliances and electronics consume electricity, even when they are not in use. The dead giveaways are those little green lights that glow in a dark room at night, or the digital clocks that practically every appliance has nowadays. Less obvious are those items such as cell phone chargers which all have transformers (the little black cubes) on their power cords. Also, any device with instant-on capability such as a television or personal computer is never truly off unless unplugged from the wall.

According to the Department of Energy, 40 percent of all electricity used to power home electronics is consumed while the products are turned off. A study found that the average home uses 50 kWh a month, just to power devices when they are off! At a cost of about $5 a month, these quiet energy consumers cost you about $50 a year.

One way to thwart these little power siphons is to unplug the devices from the wall. If that proves inconvenient use a power strip to plug in multiple items such as your computer workstation. When you are ready to shut down simply turn the power strip off.

Finding all of the small ways that a home wastes energy is the key to an energy efficient lifestyle.

Your Window of No Opportunity

Windows, doors, skylights can gain and lose heat in the following ways: conduction, radiation and air leakage. These properties can be measured and rated according to the following energy performance characteristics:

U-factor

The rate at which a window, door, or skylight conducts non-solar heat flow. The lower the U-factor, the more energy-efficient the window, door, or skylight.

Solar heat gain coefficient (SHGC)

The lower the SHGC, the less solar heat it transmits and the greater its shading ability. A product with a high SHGC rating is more effective at collecting solar heat gain during the winter. A product with a low SHGC rating is more effective at reducing cooling loads during the summer by blocking heat gained from the sun. Therefore, what SHGC you need for a window, door, or skylight should be determined by such factors as climate, orientation, and external shading.

Air leakage

The rate of air infiltration around a window, door, or skylight in the presence of a specific pressure difference across it. It's expressed in units of cubic feet per minute per square foot of frame area (cfm/ft2). A product with a low air leakage rating is tighter than one with a high air leakage rating.

Beware the Window Dressing…

Auntie Em wants to save money and cut down the drafts during those long, cold winter nights. A nice young man from The Cure All Window Company, which she's seen advertised on TV, came by and told her she can save 50% of her energy bill by replacing all of her windows with low-e coated, argon-filled double-paned windows. They have a sale going on: they will replace all 20 of her windows for $200 each.

Her niece Dorothy, a graduate of the Building Science Department at Appalachian State University, doesn't think this is the best way for Auntie Em to save on her energy bill. Dorothy uses Exercise 1 on page 3 to determine that 50% of Auntie Em's yearly energy use goes to heating and cooling her home. Auntie Em's energy bills total $2,000 annually so $1,000 of that is for heating and cooling. Typically, about 10% of the heating and cooling energy use is attributable to heat lost or gained through the windows. How long will it take Auntie Em to start saving money on her nice new windows?

Total Cost of Windows:	**20 windows X $200**	**= $4,000**
Annual Heating and Cooling Costs:		**= $1,000**
Energy Lost Through Windows Annually:		**= $100**
Annual Energy Savings From New Windows:		**= $50**
Time Needed Before Windows Start to Save Money:		**80 YEARS**

Moral of the Story: There are lots of good reasons to replace windows but your energy dollars are usually best invested elsewhere.

BUY AN ENERGY STAR MODEL

Buying an energy-efficient manufactured or modular home is a smart investment. You'll enjoy lower utility bills and increase your home's lasting value.

The Energy Policy Act of 1992 set the energy standards for manufactued homes including insulation levels in ceilings, walls and floors, and requiring double-pane windows. Manufacturers also offer special upgrade insulation packages. Ask your salesman for pricing options.

Consider purchasing a manufactured or modular home with the Energy Star certification, for even more efficiency and savings. Homes built featuring products with the Energy Star label use approximately 35 percent less energy than a typical new home. Seventy percent of all manufactured housing factories have been qualified to build homes earning the Energy Star certification. Energy Star rated manufactured homes have effective insulation, high performance windows, upgraded heating and air conditioning systems, tight duct systems and upgraded water heating equipment. Make sure all appliances are Energy Star certified.

How to improve energy efficiency in your manufactured or modular home

• Make sure your house is level. If the set-up crew fails to level the home you may experience severe door and window leaks; and multi-section homes will not have airtight connections where the interior walls and rooftop meet. Additional leveling may be required after the home has had time to settle.

• Inspect the underbelly of your home for rips and tears to insulation and patch accordingly.

• Prevent damage to the underbelly insulation with underpinning or a permanent foundation.

• If you live in a doublewide or multi-section home make sure the cross over ducts between each section have air tight seals. It is not unusual to find cross over ducts that have never been permanently sealed. There's a good chance you are loosing much of your heated and cooled air to the outdoors.

• Make sure your dryer is vented to the outdoors and not underneath the house. It is not unusual for the crew to overlook this item during setup.

• If you have storm windows make sure they are securely closed during heating and cooling season.

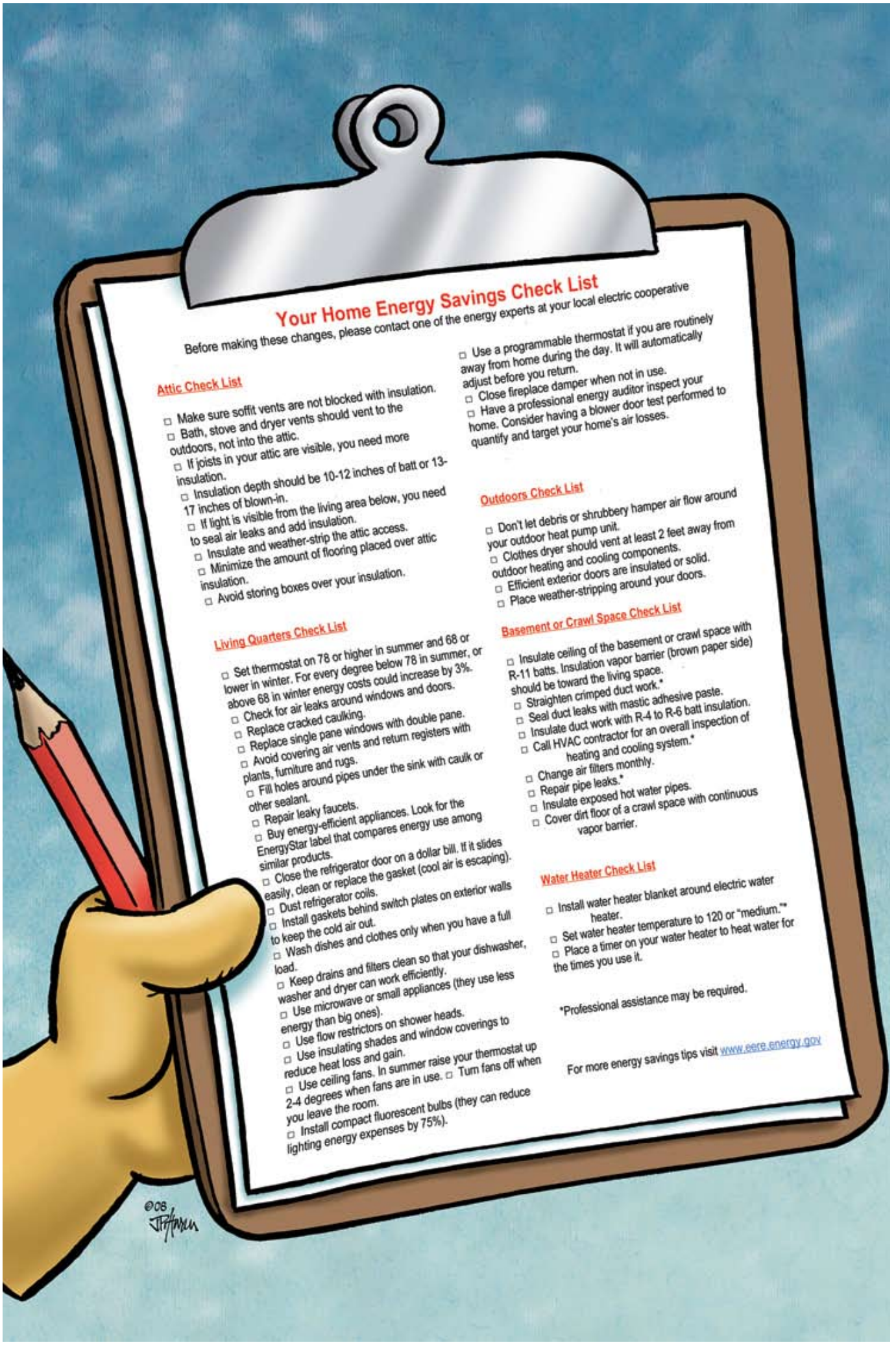
Be A Star Performer

WHEN IN DOUBT, LOOK FOR THE ENERGY STAR LOGO

Whether you're shopping for windows, appliances, a heating & cooling system, ceiling fans, lighting fixtures & bulbs, home electronics or office equipment, Energy Star has you covered.

You don't have to be an energy expert to make wise energy purchases. Just look for the Energy Star logo.

www.energystar.gov



NC GreenPower

Help Ensure Our State's Energy Future By Contributing to NC GreenPower

Now you have a convenient and effective way to help protect the environment! Electric utilities across North Carolina have come together to offer a renewable energy alternative called NC GreenPower. The program operates upon voluntary participation by those who elect to contribute at least $4 a month on their utility bill to help support a cleaner environment through electricity produced from renewable resources. Utilities participating in the NC Green Power program simply collect the funds and all contributions are then forwarded directly to NC GreenPower for the purchase of renewable energy for the North Carolina electric grid. Contributions are tax free and qualify as a tax deductible contribution for income tax purposes. Call your power provider for details.

NC GreenPower

Internet Resources

www.ncemcs.com - Website for NC's 27 electric cooperatives

www.touchstoneenergysavers.com - Website sponsored by the nation's electric cooperatives

www.aceee.org/consumerguide/index.htm - The American Council for an Energy-Efficient Economy

www.eere.energy.gov/consumer/calculators/homes.cfm - Energy calculators to boost your home's efficiency

www.energy.gov/forconsumers.htm - A consumers' guide to energy efficiency and renewable energy

www.energysavers.gov - For residential and commercial energy saving tips

www.energystar.gov - Make your next purchase an Energy Star one

www.ftc.gov/energysavings - A room-by-room savings site from the Federal Trade Commission

www.dsireusa.org - DSIRE: Database of State Incentives for Renewables & Efficiency

www.ase.org/section/_audience/consumers - Alliance to Save Energy

www.homeenergy.org - Build it right the first time around

www.energyhog.org - Get your whole family involved in energy savings

Participating Co-ops

Albemarle EMC
Hertford, NC
800.215.9915
www.albemarle-emc.com

Cape Hatteras Electric Cooperative
Buxton, NC
800.454.5616
www.chec.coop

Carteret-Craven Electric Cooperative
Morehead City, NC
800.682.2217
www.carteretcravenelectric.coop

Edgecombe-Martin County EMC
Tarboro, NC
800.445.6486
www.ememc.com

Halifax EMC
Enfield, NC
252.445.5111
www.halifaxemc.com

Roanoke Electric Cooperative
Rich Square, NC
800.433.2236
www.roanokeelectric.com

Tideland EMC
Pantego, NC
800.637.1079
www.tidelandemc.com