E-Conservation HEMS No-Cost Low-Cost Slide Notes:

1. none
2. Engaging in energy efficiency and energy conservation will …. (next slide)
3. … reduce your utility costs and … (next slide) …
4. … improve the comfort and health of your home … and (next slide) …
5. … lessen your overall impact on the environment.
6. We are going to leave here with concrete things we can do to conserve energy in our residents. We will discuss:
	1. Where energy is used in a home?
	2. How changing some things you do can result in saving money.
	3. Ways to reduce energy consumption by identifying your home’s energy conservation needs and making low-cost changes.
7. Do you know what you spend on your utility bills annually? Do you feel like you have power to control what you spend?
8. The typical US family spends around $2,000 a year on their home’s utility bills (Dept of Energy 2012)
9. North Carolina home energy use is slightly below the national average.
10. What uses the most energy in the typical home? Notice that heating a home accounts for 45% or a home’s annual energy use. Keep in mind that this is a national average.
11. So, how can you save energy in your home? One thing you can do is to USE LESS. In many cases, you can decrease the amount of energy you use and have just as much (or more) comfort in your home. You just need to create some good habits … and change some bad habits. Often, just KNOWING the strategies that will save you money leads to changes that will lower your utility bills. These are NO-COST things you can begin doing today that will help you use less energy.
12. No-Cost things you can do to lower your utility bills: Turn off the lights (with these guidelines):
* Incandescent lights - should be turned off whenever they are not needed, because they are the least efficient type of lighting. 90% of the energy they use is given off as heat, and only about 10% results in light.Turning lights off will also keep a room cooler, an extra benefit in summer.
* Halogen Lighting - more efficient than traditional incandescent bulbs but use the same technology and are far less efficient than CFLs and LEDs. Therefore, it is best to turn these lights off whenever they are not needed.
* CFL Lighting - Since they are already very efficient, the cost effectiveness of turning CFLs off to conserve energy is a bit more complicated. A general rule-of-thumb is this:
* If you will be out of a room for 15 minutes or less, leave it on.
* If you will be out of a room for more than 15 minutes, turn it off.
* LED Lighting - should be turned off whenever they are not needed. LEDs are very efficient and take very little energy to turn on so turning them on and off frequently does not add to their operating expense.
1. While energy used for space conditioning has declined, energy consumption for appliances and electronics continues to rise. Why do you think this change has occurred? (Answer: The increased number of devices that consume energy in homes such as chargers, laptops. - Phantom Energy Use)
2. A phantom load is any device that consumes electricity when turned off but still plugged into an outlet. These electronic devices provide the modern-day conveniences we rely on, but they also waste energy and cost money. The U.S. Department of Energy says on average, 75 percent of the electricity used to power home electronics is consumed while the products are turned off.
	1. When the television is turned off, it isn’t really off. It’s sitting there, waiting for someone to press the on button of the remote, and waiting uses energy. TVs also use energy to remember channel line-ups, language preferences and the time. DVD players, DVRs, video game consoles, cable or satellite boxes and stereos also use energy when turned off. Home office equipment such as desktop computers, monitors, printers and anything with a digital display such as microwaves and coffee machines are also working against your electric bill. And many of those chargers around the house that keep cell phones, power tools and MP3 players at the ready constantly draw power when plugged in.
3. The best way to get rid of your phantom load is to unplug appliances and electronic devices every night or when not in use, but that isn’t convenient or easy to remember. And some devices need to stay on in a standby mode to work properly.
	* Additional Tips:
		+ Group appliances and electronics together on power strips and switch on only when needed, however be careful not to overload your power strip.
		+ Unplug unneeded night-lights.
		+ Screen savers do not reduce energy used by monitors; automatic switching to sleep mode or manually turning monitors off is a better energy-saving strategy.
		+ Turn off your computer when not in use for 20 minutes or more and both the computer and monitor if away for two hours or more.
* Unplug battery chargers when the batteries are fully charged or the chargers are not in use.
* Buy ENERGY STAR equipment, in which standby power use may be lower than one watt.
* Purchase and use “smart strips”.
* Smart strips are advanced power strips that allow you to plug an appliance into a master outlet, which controls the other outlets. For example, you can plug your computer into the master outlet, and plug speakers, printers and monitors into “automatic” outlets on the strip. When you turn off your computer (master outlet) all the appliances plugged into the “automatic” outlets will turn off as well. Smart strips usually also have one or two “constant” outlets which allow for appliances plugged into those to always stay on unless manually turned off.

16. Control Your Thermostat: You can save on your heating and cooling bill by keeping your thermostat at an energy efficient and comfortable setting during the day and adjusting the temperature a few degrees at night and when you are not home. During the colder months, try setting the thermostat at 68°F or less during the day and 60°F when you are away or sleeping. For cooling, set your thermostat as high as comfortable in the summer while still maintaining comfortable humidity levels. Because of the way heat pumps operate, it is best to operate a heat pump unit at a constant moderate setting or use a programmable thermostat specifically designed to work with heat pumps.

Remember, too, that a thermostat is not like a gas pedal on a car. Setting the temperature significantly higher or lower in order to heat or cool faster does not work. It will take the same amount of time to reach the temperature you want if you set the thermostat at your goal temperature and wait for the unit to do its work. Also, it’s likely that if you take the gas pedal approach you will forget that you’ve made the dramatic adjustment and end up cooling or heating at a higher or lower temperature than you truly want, wasting money in the process.

17. Lower Your Water Temperature. Most water heaters are set at 140°F. This high setting is only needed if you have a dishwasher without a booster heater. To save six to 10 percent on your water-heating costs, turn the temperature down to 120°F (medium setting on a gas heater dial). Most electric heaters have both an upper and a lower thermostat to adjust.

 - Water heated at 140ºF also poses a safety hazard—scalding.

 - Savings resulting from turning down your water heater temperature are based on two components:

* + - 1. Reduced standby losses (heat lost from water heater into surrounding basement area); and
			2. Consumption (from water demand or use in your home). Set too high, or at 140ºF, your water heater can waste anywhere from $36 to $61 annually in standby heat losses and more than $400 in demand losses.
* Tip: Turn down or off when away.
	+ If you plan to be away from home for at least 3 days, turn the thermostat down to the lowest setting or completely turn off the water heater. To turn off an electric water heater, switch off the circuit breaker to it. For a gas water heater, make sure you know how to safely relight the pilot light before turning it off.

18. More No-Cost things you can do to save energy:

* For small meals, use microwave, crock pot or toaster oven
* Use the smallest pan necessary for the job
* Match pan size to heating element
* Cover pots and pans – this improves cooking efficiency and keeps the kitchen cooler
* Reduce cooking time by defrosting food in refrigerator first
* Avoid looking in the oven as you cook!
* Remember to use the kitchen exhaust fan when cooking and turn it off after cooking.
* Let hot food cool before storing it in the refrigerator
* When washing dishes, run full loads, use energy saving cycles, use no-heat dry cycle, don’t pre-rinse, and load dishes according to manufacturers instructions.

19. Refrigerators make up about three to five percent of your home’s total energy use.

* To keep out warm room air, keep the refrigerator door closed as much as possible.
* Make certain that door gaskets have a tight fit. To test the fit, close a dollar bill in the door and try to pull it out. If it falls out or can be removed easily, you need to remove and replace the gasket.
* Keep the refrigerator at 32–40°F (below 41°F for food safety) and the freezer at 0°F. If you have more than one refrigerator or freezer and one doesn’t get much use, unplug it and save.
* Clean your refrigerator coil twice a year or more: Condenser coils in your refrigerator cool a refrigerant liquid, which is then use to cool the air inside the fridge. They are much less efficient at doing their job when they are covered with lint, dust, and other kitchen floor debris.
* Add this reminder to your calendar for every 4 – 6 months so you remember this task!

20. Use lower temperature settings – Wash clothes in cold water when possible

* About 90 percent of the energy used by washing machines goes toward water heating. Often, using hot water is unnecessary except for special loads such as diapers or stained work clothes. To save on energy costs, try washing in cold water, using cold water detergents.
* Load the washer to capacity
* Don’t over dry clothes
* Dry 2 or more loads in a row - Drying consecutive loads harvests heat in dryer from last load
* Clean dryer filter after each use
* Dry full loads
* Clean exhaust vents
* Make sure the outdoor dryer exhaust door closes when dryer is off, the dryer vent hose is tightly connected to inside wall fitting, the dryer vent hose is tightly connected to dryer, and that the dryer vent hose is not kinked or clogged.
* To save even more, on sunny days, use the clothesline instead of the dryer to dry your laundry

21. No-Cost things to help your HVAC system run more efficiently:

* Keep your outside unit clear of vegetation and other obstructions so it can run properly
* Keep supply and return vents clear
* Keep supply vents open and clean
* Make sure your condensate drain is clear of debris and working properly

22. Regularly clean or replace your air filter:

* All forced air furnaces and central air conditioners have air filters that filter particulates such as dust and dirt. Filters serve two purposes—to protect the unit and to help with the air quality in the home. If not periodically cleaned or replaced, dirty filters can greatly affect the heating and cooling ability of your unit and waste valuable energy. Some filters are disposable while others can be washed and reused. It is important to know what kind of filter you have and not reuse disposable filters. Check your filters each month and clean or replace them as needed.

23. Plant native plants – they require less watering

* Watering – use drip irrigation and/or water early in the morning
* Use a rain barrel to collect water from gutters and use that water for watering plants
* Have less grass and more natural groundcover, native beds, etc. Grass requires more water, mowing (gas), and chemicals.
* Shade your HVAC unit while still leaving it free of debris
* Incorporate shade trees to protect your home from the harsh sun in the summer months.

24. Now lets discuss some Low-Cost things you can do to lower your utility usage. These changes do not require much initial cost and pay for themselves through the savings they create. In other words, these low-cost energy conservation tips are an investment that will help you save money over time.

25. When making a purchase, consider the TOTAL cost of the item – which takes into account the initial purchase price AND the OPERATING COST, the expense of using that device over its lifetime.

26. A CFL bulb, for example, lasts 10 times longer than an incandescent bulb and requires less energy to operate. So, how much difference would you guess there is in the TOTAL price of an incandescent over a CFL?

27. This is an example of annual cost for different bulbs. CFL bulbs will typically last 10 years.

* What are some benefits to using CFL or LED? Answer:
* Give off less heat
* Efficient: CFLs are four times more efficient and last up to 10 times longer than incandescents. A 22 watt CFL has about the same light output as a 100 watt incandescent. CFLs use 50 - 80% less energy than incandescents.
* Less Expensive: Although initially more expensive, you save money in the long run because CFLs use 1/3 the electricity and last up to 10 times as long as incandescents. A single 18 watt CFL used in place of a 75 watt incandescent will save about 570 kWh over its lifetime. At 8 cents per kWh, that equates to a $45 savings.
* High-Quality Light: Newer CFLs give a warm, inviting light instead of the "cool white" light of older fluorescents. They use rare earth phosphors for excellent color and warmth. New electronically ballasted CFLs don't flicker or hum.
1. Consider buying at the best price when purchasing electronics, too.
* Look for the Energy Star and Energy Guide Label. This guide will help you determine the TOTAL operating cost of the item.
* ENERGY STAR is the trusted, government-backed symbol for energy. The ENERGY STAR label was established to make it easy for consumers to identify and purchase energy-efficient products that offer savings on energy bills without sacrificing performance, features, and comfort.

29. Buy at the best price:

* Take advantage of rebates and incentives
* Your utility company may offer rebates and incentives
* Energy.gov will let you know of rebates, incentives, and loans you may qualify for. (Agent: click on link at bottom of slide. Filter for different types of “savings” to demonstrate how to use site.)
* North Carolina has Energy Star Qualified Products Sales Tax Holiday - exempt from sales and use tax when purchased between the first Friday in November to the following Sunday.

30. Energy Star Qualified Products Sales Tax Holiday - exempt from sales and use tax when purchased between the first Friday in November to the following Sunday. So, if you plan to get a new appliance, do your research and make the purchase the first weekend in November.

31. One of the most cost effective energy efficiency strategies you can do to your home is sealing and insulating.

* Air leakage between your homes interior and the outdoors can be a constant drain of energy.
* Most people know where some of the air leakage is in their home because they feel drafts -- near windows, under doors, etc. Others are a little less obvious.
* Leaks often occur when two different materials meet, I.e. where foundation and walls meet, around windows, etc.

32. Common Household Air Leaks

* Most people call air leaks "drafts." You may feel these drafts around windows and doors and think these leaks are your major source of wasted energy. In most homes, however, the most significant air leaks are hidden in the attic and basement. These are the leaks that significantly raise your energy bill and make your house uncomfortable.

33. Attic Hatch

* Wiring Holes
* Plumbing Vent
* Open Soffit (the box that hides the recessed lights)
* Recessed Light
* Furnace Flue or Duct Chaseway (the hollow box or wall feature that hides ducts)
* Basement Rim Joists (where the foundation meets the wood framing)

34. Locating and sealing air leaks:

1. Learn how to find and seal hidden attic and basement air leaks;
2. Determine if your attic insulation is adequate, and learn how to add more;
3. Make sure your improvements are done safely;
4. Reduce energy bills and help protect the environment

35. Air seal before you insulate and insulate well

* Sealing and insulating the "envelope" or "shell" of your home (outer walls, ceiling, windows, doors, and floors) is often the most cost effective way to improve energy efficiency and comfort.

36. If you feel warm or cold drafts in your home, particularly near wall outlets, windows, doors and fireplaces, then consider air sealing. On windows, use weatherstrip tape along the gap where the glass meets the frame. To stop leakage under exterior doors, install an inexpensive door sweep. If the door leaks around the entire frame, install foam weatherstripping with adhesive backing between the door and the frame.

* Use caulk or foam to seal around door and window frames and holes around water pipes and plumbing fixtures. Use foam gaskets that fit behind the cover plates to seal air leaks around light switches and electrical outlets. Remember, every hole you seal means fewer drafts and a more comfortable, energy efficient home.

37. If you rarely use your fireplace, make sure the damper is closed and the opening is sealed. Another option is to use a chimney balloon. These are inflatable balloon-like items that can be installed to help block air leakage in an unused fireplace.

38. Once you have sealed air leaks, insulate. For insulation to work it must:

* Stay in place
* Be installed without:
* Gaps and voids
* Compression and low spots
* Touch the air barrier
* Stay dry

39. Recommended Levels of Insulation

* Insulation level are specified by R-Value. R-Value is a measure of insulation’s ability to resist heat traveling through it. The higher the R-Value the better the thermal performance of the insulation. The table below shows what levels of insulation are cost-effective for different climates and locations in the home.

40. Insulate Your Water Heater: If your water heater is located in an unheated location, such as a garage or attic, wrap the tank in a blanket of glass fiber insulation. This action can help reduce heat loss by as much as 25 to 45 percent, resulting in a cost savings of four to nine percent on your water- heating bill. Water heater insulation kits are available at your local hardware store or through your utility company. Insulation wraps and blankets are most appropriate for older water heaters and those located in unheated areas. Some manufacturers do not recommend an insulation wrap for newer water heaters.

41. Replace shower heads: A standard showerhead uses up to eight gallons of hot water per minute. Replacing your showerhead with a quality low-flow showerhead will allow you to use only one to two gallons of water per minute. Newer low-flow showerheads are able to maintain water pressure while using significantly less water. Low-flow showerheads typically pay for themselves within a year. With low-flow showerheads you can save twice—both on your electric or gas bill and on your water use bill.

42. Keep Your HVAC Unit in Good Working Order

* Clean/replace filters regularly
* All forced air furnaces and central air conditioners have air filters that filter particulates such as dust and dirt. Filters serve two purposes—to protect the unit and to help with the air quality in the home. If not periodically cleaned or replaced, dirty filters can greatly affect the heating and cooling ability of your unit and waste valuable energy. Some filters are disposable while others can be washed and reused. It is important to know what kind of filter you have and not reuse disposable filters. Check your filters each month and clean or replace them as needed.
* Dirty filters reduce the efficiency of your system and can block air circulation. Some filters are removed, washed and replaced; others are replaced with new filters. Filters that have an adhesive coating are more efficient in trapping dust. Know the size filter needed for your heating system and keep a good supply on hand. In most cases, the filters size is printed directly on the filter itself. Check your filter monthly -- most will need replacing every 4-6 weeks. (add this reminder to your calendar!)
* Air should circulate freely in your home. To help, periodically remove register grills.
* Vacuum the grill and duct area in each room. This removes dust build up that can keep air from circulating freely. Clean the return grill helps clear air flow back to the furnace.
* Never shut off a room or vents in a room. Most people think by shutting down a part of the house they are saving energy. What they are doing is putting pressure on the HVAC unit to work harder thus not helping with the reduction of energy consumption. Homeowners , instead, can cause an IAQ problem by increase humidity level in a room. Air that has been shut off may put pressure on your duct system and cause duct leakage to occur.

43. Have your unit serviced by a professional HVAC technician

* Heating systems, like other pieces of equipment in your home, require maintenance in order for them to operate efficiently. Most maintenance should be done by a qualified service contractor, however there are some things you can do yourself.
* To prevent damage to the unit, you should take a few precautions outside your home. Do not allow the passage of air to be obstructed in any way. Make certain that all, weeds and tall grasses are away from the unit. Clean leaves and debris from around he outside condenser on heating and cooling systems. You can plant trees and shrubs near the unit to aid in shading the unit so it doesn’t kick on as often. However keep in mind that you need to pay close attention to the distance of these plants to unit so air flow is not blocked.

44. We have discussed many no-cost and low-cost strategies for saving energy. Some of these strategies are simple while others require a little research and investigation. I suggest you make a list of things you can do today, next week, next month, etc. Do the easiest items now and you will begin to save money. Then add items from your TO DO list over time so your savings will increase.

* What are some things you think you can start doing today? In the next week?
* What are some of the roadblocks you see that may discourage you from implementing some of these changes?

45. none