Energy Efficiency For Condominiums: A Guide For Apartment Owners

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INTRODUCTION

This guidebook contains suggestions which will help you save energy and money in the operation of your Florida condominium. Some of the recommendations are maintenance tips, while others are simple things you can do to cut utility costs without sacrificing comfort.

The guide reviews the effectiveness of such energy-saving items as ceiling fans or timers for air conditioning units. Particular attention is given to how one system affects another — for example, the effect of a bathroom exhaust fan on air conditioning.

Many condominium owners have tried one or more of these recommendations and are saving energy and money as a result. We hope this guidebook will also help you.

AIR CONDITIONING

In most Florida residences, air conditioning equipment uses more electricity than does anything else. This section contains ideas on how to get more cooling for your energy dollar. There are four main ways to cut your air conditioning costs.

1. Reduce the amount of heat and moisture entering the conditioned space by caulking and weatherstripping.
2. Raise the thermostat temperature setting.
3. Go without air conditioning whenever possible.
4. Increase the operating efficiency of the air conditioner.

The first three ways are simple but very important. Checking the operating efficiency of the air conditioner is equally important, but a little more difficult. This section provides you with a step-by-step guide.

Window Units

FILTERS

Cleaning or replacing air filters is important and easy, but needs to be done so often that paying a serviceman would not be economical.

The filter of a window/wall unit is located directly behind the front cover. In most units, the front cover snaps in place and is removed by grasping the top or bottom corners and pulling it out. If the cover offers...
unusual resistance, check for screws holding it in place.

Remove the filter and hold it up to the light. If at least 25 percent of the light is visible through the filter, you can reuse the filter. If the light is less than 25 percent, then the filter should be cleaned or replaced. Note especially any coating of lint or material other than dirt which may clog the filter and reduce air flow.

Estimated Savings: Dirty filters add up to 10 percent to air conditioner operating costs.

COILS

Inspect the cooling coils and the condenser coils for dirt. The cooling coils remove heat from the air and transfer it to the condensing coils. The cooling coils are visible from the front of the unit when the front cover is removed.

The condenser coils are near the back of the unit and are usually inaccessible unless the unit is withdrawn from its outer case.

Dirt accumulation on the coils and the fins of the fan assembly will reduce the cooling capacity of the unit. The coils and the fan assembly can be brushed out or cleaned with a vacuum cleaner nozzle.

Estimated Savings: Dirty cooling coils can add 10 percent to the operating costs of an air conditioning unit. Dirty condenser coils can add as much as 50 percent to operating costs.

COOLING CAPACITY

Inspect the fan and measure the temperature of the cooled air. Most fan motors are self-lubricated, but they sometimes get dirty and slow down. Air flow can also be reduced by dirty fan blades. In addition, the unit sometimes loses freon, which decreases efficiency. The following procedure is useful in detecting inefficient operation, and is logically performed after cleaning the cooling coils, the condensing coils, and the fan assembly.

Unplug the unit and manually spin the fan. It should rotate freely and smoothly. If it turns with some difficulty, refer to the owner's manual for oiling instructions.

With the unit reassembled and running, measure the temperature of the cooled air and then the temperature of the room air. If the cooled air temperature is more than 20° cooler than that of the room air, the fan is probably running too slowly. If the cooled air temperature is less than 10° cooler than that of the room air, the unit might be low on freon. These two problems normally require repair by a qualified service person.

Estimated Savings: Slow fan speed or dirty fan blades can increase the operating costs of an air conditioner by 15 percent.

CONDENSER AIR DISCHARGE

Test the air discharge from the condenser on the outside of the unit with a thermometer to see if the hot air is circulating back into the intake. This is called short circuiting, and can result if the unit is located against a fence or is surrounded with shrubs near a wall. If short circuiting is occurring, the air temperature at the intake will be higher than the outside temperature.

Estimated Savings: Short circuiting of the condenser air can increase operating costs by as much as 100 percent.

Built-in Units

There are basically two types of built-in air conditioning systems. These are air-to-air systems and air-to-water systems.

AIR-TO-AIR SPLIT SYSTEMS

Air-to-air split air conditioning systems have two boxes — the air handler/evaporator unit (AHU) located inside the dwelling and the compressor/condenser unit located outside, often on the roof. They are subject to the same malfunctions as window units, but access for testing purposes is slightly different.

Filters

Replace or clean filters when they are dirty. The air handler unit (AHU) is usually located above a dropped ceiling in an attic or a closet. The filter will be located somewhere in the return-air line.
If the AHU is overhead, a return-air grille will be located in the ceiling and the filter will be located immediately behind the return-air grille.

If the AHU is in an inside closet, the air return will most likely be the louvered door to the closet. In this case, the filter will be located either at the bottom or on the side of the unit.

If the AHU is located in a closet which opens into a hallway, the return—air grille will open into the interior of the condominium, but the filter will probably be located at the bottom of the AHU, depending on whether or not the return air passes through a duct to the AHU.

Once you have located the filter, take it out and hold it up to the light. If at least 25 percent of the light is visible through the filter, you can reuse the filter. If the light is less than 25 percent, the filter should be cleaned or replaced. Try washing the filter with a hose, or under the shower. If it comes out clean and retains its shape after it dries, it can be reused. Be sure to note the dimensions of the filter if it needs to be replaced. NEVER operate an AHU without a filter.

Estimated Savings: Dirty filters add up to 10 percent to air conditioning operating costs.

**Coils**

Inspect the cooling coils and condenser coils for dirt. Gaining access to the cooling coils is sometimes difficult. The coils are located inside the air handler unit (AHU) and resemble an automobile radiator. Getting access to the cooling coils involves removing one or more side panels of the AHU.

If you decide to inspect or clean your cooling coils, two very important rules must be followed:

1) NEVER REMOVE SCREWS OR PANELS UNLESS ALL POWER TO THE UNIT IS SHUT OFF
2) NEVER REMOVE ANY PARTS UNLESS YOU ARE CONFIDENT YOU CAN PUT THEM BACK AGAIN.

If the coils are accessible, vacuum them clean, being careful not to bend any of the fins.

The condenser coils are located in the compressor/condenser unit outdoors. The coils frequently get clogged with dirt, grass, leaves, pebbles, and other debris. The condenser coils also look like an automobile radiator and can be cleaned with a vacuum cleaner, water hose, or brush. Again, take care not to bend or puncture the fins or tubing.

Estimated Savings: Dirty cooling coils can add 10 percent to operating costs; dirty condenser coils can add up to 50 percent.

**Cooling Capacity**

Make temperature checks. Improper temperatures indicate problems. Try the temperature measurements that are listed below.

**Inside:**
- Measure and record the temperature near the return-air grille (room air).
- Measure and record the temperature of the air leaving each supply grille (cold air) by inserting the thermometer into the grille.

The cool air temperature should be 15° to 20°F cooler than the return air. The temperature at each supply grille should be within 2°F of the temperature at all other supply grilles. If the difference between supply and return air exceeds 20°F or is less than 10°F, you might want to have a service person check out your system.

**Outside:**
- Measure the outside air temperature with the thermometer shaded.
- Measure the condensing unit intake air temperature.
- Measure the condensing unit exhaust air temperature.

The intake air temperature should be the same as the outside air temperature. If it is higher, some of the exhaust air is getting drawn back into the intake. This can happen if shrubs, trees, overhangs, fences, or walls are channeling the exhaust back around to the intake. The obstructing object should be moved if this is happening.

Exhaust air should be 10° to 20°F warmer than intake air. If this is not the case, the condensing unit may not be operating properly.

Estimated Savings: Interferences with cooling capacity can add 5 to 50 percent to operating costs, depending upon the problem.
AIR-TO-WATER SYSTEMS

In an air-to-water system, heat is removed from inside air and transferred to water rather than to outside air. The condensing coil is replaced by a heat exchanger in which water removes heat from the refrigerant which, in turn, has removed heat from the dwelling.

Air-to-water units are often self-contained, and look like the inside air handler units of air-to-air systems. Self-contained units are especially popular in newer mid-rise and high-rise condominiums, where it is undesirable to have compressor units on the ground or on the roof. These units have water lines, rather than refrigerant lines. The lines are usually rubber hoses equipped with shut-off valves.

Some air-to-water systems are split systems in which the compressor and heat exchanger are located outside the building. This is more common in low-rise units.

Filters

Replace or clean filters when they are dirty. The air handler unit (AHU) is usually located above a dropped ceiling, in an attic or closet. The filter will be located somewhere in the return-air line.

If the AHU is in an inside closet, the air return will probably be the louvered door to the closet. In this case, the filter will usually be located on the side near the top of the unit.

If the AHU is overhead, a return-air grille will be located in the ceiling and the filter will be located immediately behind the return-air grille.

If the AHU is located in a closet which opens into a hallway, the return-air grille will open into the interior of the condominium, but the filter will probably be located at the side of the AHU, depending on whether or not the return air passes through a duct to the AHU.

Remove the filter and hold it up to the light. If at least 25 percent of the light is visible through the filter, you can reuse the filter. If the light is less than 25 percent, the filter should be cleaned or replaced. You may be able to wash the filter with a hose, or under the shower. If it comes out clean and retains its shape after it dries, it can be reused. Be sure to note the dimensions of the filter before you buy a replacement. NEVER operate an AHU without a filter.

Estimated Savings: Dirty filters can add up to 10 percent to the air conditioning operating cost.

Coils

Inspect the cooling coils for dirt. The cooling coils are inside the unit. If the filter is on the side, TURN OFF THE POWER, and remove the top panel. The cooling coils look like an automobile radiator.

If the coils are accessible, vacuum them clean, being careful not to bend any of the fins.

NEVER REMOVE ANY SCREWS UNLESS ALL POWER TO THE UNIT HAS BEEN SHUT OFF ALSO, NEVER REMOVE ANY SCREWS UNLESS YOU ARE CONFIDENT THAT YOU CAN PUT THEM BACK AGAIN.

Estimated Savings: Dirty cooling coils can add 10 percent to operating costs.

Cooling Capacity

Improper temperatures indicate problems. Try the temperature measurements listed below.

Air Temperature Checks:

Measure and record the temperature near the return grille (room air). Measure and record the temperature of the air leaving each supply grille (cold air) by inserting the thermometer into the grille.

The cool air temperature should be 15° to 20°F cooler than the return air temperature. At each supply grille the temperature should be within 2°F of the temperature at all other supply grilles. If the difference between the supply air and the return air exceeds 20°F or is less than 10°F, you might want to have a service person check out your system.

Water Temperature Checks:

• Measure and record the inlet water temperature. Place a thermometer in contact with the metal pipe near the unit and wrap a piece of insulation or a pot holder around the thermometer and pipe. The insulation wrap insures that the temperature of the water in
the pipe is being measured rather than the temperature of the surroundings.

- Measure and record the outlet water temperature in a similar fashion.

Both of the above measurements should be made while the unit is running. The cooler pipe is the water supply and the warmer one is the water return. The supply water temperature should not be above 85°F, and the return water should not exceed the supply temperature by more than 10°F.

If the return water temperature is more than 10°F warmer than the supply, the circulation rate is probably too low. This can be caused by clogging within the heat exchanger or by low pressure in the water line. A maintenance person should be called to check it.

If the return water temperature is much less than 10°F warmer than the supply, it may not be removing enough heat. Again, the system should be checked.

Estimated Savings: Interferences with cooling capacity can add 5 to 50 percent to operating costs, depending on the problem.

**Central Systems**

Window units, air-to-air units, and air-to-water units comprise the majority of condominium air conditioners, but other types of systems are used occasionally. In general, these systems provide chilled water to each dwelling from a single, central chiller system. Individual apartment systems consist of fan coil units in which dwelling air is cooled by blowing it across a chilled water coil.

Other systems involve a central air conditioning unit which supplies cool air to all units in the building. In either case, maintenance should be handled by condominium maintenance personnel.

**Sun Control**

The major source of heat gain is direct sunlight shining through windows. Before purchasing any of the following items, check with your condominium association to be sure that the rules of the association do not prohibit their use.

**WINDOW DRAPERIES**

Drapes reduce the heating effect from the sun by as much as 40 percent, depending on the exposure. Blackout drapes, which have a semi-reflecting surface, are more effective than semitransparent drapes. If they are heavy enough, they are also useful for winter insulation.

For drapes to be effective, a closed valance should be used, and the drapes should extend to the floor and be reasonably taut. This is because the sun heats the air between the glass and the drape. Since this warm air is lighter than the colder air in the room, it rises between the window and the drape, and flows into the ceiling space. If this warm air near the ceiling is disturbed by the air supply from the air conditioner, it will mix with the air in the room. This will raise the cost of cooling the room.

Estimated Savings: Full drapes on east or west windows reduce cooling needs approximately 15 kilowatt hours (KWH) per year for each square foot of glass covered; on the south they reduce cooling needs by approximately 8 KWH per year for each square foot of glass covered.

**WINDOW SHADES**

Shades or venetian blinds provide protection similar to that of drapes. If they are a light color they reflect a large percentage of the sun’s heat.

Estimated Savings: Window shades provide about the same savings as drapes. When shades are used with drapes the combined savings is about 20 KWH per year for each square foot of east or west glass covered and about 10 KWH per year for each square foot of south-facing glass covered.

**SHADED WINDOWS**

Overhangs, shutters, and awnings can reduce the amount of heat from the sun by almost 90 percent on windows that would otherwise be in direct sunlight. By comparison, drapes and shades give only about 60 percent reduction in direct sunlight. If a window has drapes, shades, and an awning, up to 95 percent of the heat from direct sunlight can be eliminated.

Estimated Savings: Overhang alone: east and west windows — about 20 KWH per square foot of glass per year; south windows — about 10 KWH per square foot of glass per year. Overhang with shades
and/or drapes: east and west windows — about 21 KWH per square foot of glass per year;

**SOLAR FILM**

Solar film is very effective in reducing the effect of solar heat on air conditioning systems. However, it has two disadvantages: (1) light is somewhat reduced on days when the sun is not bright, and (2) solar film is subject to blistering if not properly applied, and will peel or become scratched if not carefully placed on a clean window.

The heat-reducing effect of solar film depends on its color and the particular manufacturer. The relative savings can be determined from the manufacturer’s certified test data.

Estimated Savings: Savings vary from 30 to 60 percent of the savings possible with overhangs. The savings due to overhangs and solar film are about the same as the savings resulting from the combination of overhangs and drapes.

**VENTILATION**

Ventilation is important because it affects air conditioning and heating requirements. Ventilation fans are often located in bathrooms, kitchens, and laundries.

Remember, any air removed from the building must be replaced, and the energy required for cooling or heating the replacement air is nearly twice that of recirculated air.

**Individual Switches for Bathroom Fans**

Check the arrangements of bathroom exhaust fans. The usual capacity of a bath exhaust fan is 75 cubic feet of air per minute. This air must be replaced with outside air entering the adjoining space. To find out if it is feasible to switch on the exhaust fan separately, count how many times the bathroom light is turned on when the commode, bathtub, or shower is not in use. If this amounts to more than half of the time that the exhaust fan operates, it is probably economical to put the fan on a separate switch. Switches with a time delay, which permit the fan to run a little longer after the switch is turned off, work very nicely for clearing out any odors.

Estimated Savings: Bath exhaust fans use 0.5 KWH per hour. You will save an amount proportional to the reduced time the fan operates.

**Common Exhaust Systems**

In some mid- and high-rise units, bathroom ventilation is provided by a fan on the roof which vents several bathrooms. This arrangement may allow your cooled air to escape even when your bathroom switches are off. To check this, see if a single sheet of toilet paper sticks to the vent grille. If it does, you may be using up to 360 KWH extra each month that your air conditioner is on. At 6 cts per KWH, this is good reason for a condominium association to investigate user-controlled vent systems.

Estimated Savings: Ventilation losses of conditioned air may cost 300 to 400 KWH per month.

**Range Hoods**

Check the kitchen exhaust fan for type and air quality. If the range hood is a recirculating type with a filter, there is no outside air drawn and there is very little energy loss.

If the exhaust hood is connected with a duct to the outdoors so that air is removed from the kitchen, the time cycle of this hood and its operation are important. These fans remove approximately 200 cubic feet of air per minute which must be replaced with outdoor air.

When air vented by the range hood is warmer than the outside air, it is easier for the air conditioner to cool the outside replacement air than to cool the vented air if it were recirculated. So the simple rule is that if air drawn into the range hood is cooler than outside air, it is better to recirculate it. If it is warmer than outside air, it is better to vent it to the outside.

Estimated Savings: Using the hood only when needed will save 1.5 KWH for each hour the hood is unnecessarily left on when air conditioning is in use.

**Refrigeration**

If the grille for the waste heat discharge is dirty, operating costs for the refrigerator rise.
Remove the grille at the bottom where the warm air comes out. Clean the grille and the coils behind it if they are dirty.

Sometimes the thermostat for the apartment or the house is located on the wall just outside the kitchen not too far from the refrigerator. Take a thermometer and check the air temperature around the thermostat compared to the air temperature in the living room. The hot air from the refrigerator may be going past the thermostat, causing the thermostat to call for more cooling than is necessary. If so, the thermostat must be set higher in order to keep the room from getting too cold.

Estimated Savings: Keeping the refrigerator grille and coils clean can save up to 50 KWH per month — more savings are possible if corrections are made for hot air from the refrigerator affecting the thermostat.

**Paddle Fans**

Paddle fans can provide comfort at temperatures as high as 82°F and can sometimes eliminate the need for air conditioning. They should be installed so blades are between 7 and 9 feet above the floor. When ceiling heights exceed 8 feet, a blanket of warm air tends to rise to the ceiling. If a ceiling fan is mounted too close to a high ceiling, it will blow warm air toward the floor and increase the load on the air conditioner.

Ceiling fans should be placed so their blades are not under light fixtures, since rotating blades chop the light, creating a flicker effect. Always be sure that fans are mounted securely.

Estimated Savings: Up to 5 percent of your air conditioning cost for each degree the thermostat can be raised.

**SPACE HEATING**

Space heating can account for up to 20 percent of your annual utility bill. This will vary, of course, depending on whether you live in northern or southern Florida. How warm you choose to maintain your dwelling in the winter will also affect heating costs significantly.

**Heater Location**

Determine if your heater is located in the most efficient place. Because warm air rises, heating devices should be arranged so that they force warm air towards the floor or take cold air off the floor and put it back towards the ceiling. Cold air is eventually replaced by warm air during the recirculation process. If electric unit heaters are used they should be placed closer to the floor, since most equipment of this type does not have very much air velocity. If you blow smoke into the air stream you can see where the air is going.

Estimated Savings: Redirecting your heat enables you to lower your heating costs up to 5 percent for each degree you lower your room temperature.

**Air Supply Patterns**

If warm air is supplied near the ceiling, it must be forced to the floor. Most sidewall grilles have adjustable blades so that the air can be directed where needed. If ceiling outlets are used, adjustable devices are available which will force the warmer air towards the floor before it rises to the ceiling.

A good method for determining the effect of the air pattern is to measure the temperature at the ceiling and at 5 feet from the floor. A measurement should also be taken within 1 foot of the floor for comparison. Warm air supplied from high sidewall grilles and ceiling outlets will stratify, and you may find differences as great as 10° to 15°F Paddle fans and recirculating fan ducts that pull warm air down from the ceiling are very effective in this application, provided that the temperature of the ceiling air exceeds 90°F.

Estimated Savings: Better air distribution can save up to 5 percent of heating costs per degree of temperature setback.

**Time Cycling**

If your electric bills are high during the heating season, or you find it uncomfortable to awaken to a cold house, you might want to consider a night setback thermostat.

These thermostats automatically set back to a predetermined temperature at a given hour and then reset to a warmer temperature at a specified time. This allows the house to cool down overnight and...
then warm back up in the morning. They can be adjusted to set back the temperature an hour or two before bedtime, since many dwellings remain warm several hours after the heat is turned off.

Estimated Savings: Depending on settings, up to 15 percent of heating costs can be saved.

**WATER HEATING**

Heating water probably accounts for 20 to 30 percent of your energy expenditures. Three basic options are available for reducing water heating costs:

1. Use less hot water.
2. Reduce hot water temperature.
3. Reduce system heat losses.

**Flow Controls and Timers**

The normal water flow in a shower is approximately 5 gallons per minute. Two methods can be used to reduce the flow rate to 3 gallons per minute. The simplest method is to remove the shower head and insert an inexpensive flow restrictor washer.

If this method is unsatisfactory, special shower heads which regulate water flow can be purchased for $10 to $20.

Hot water flow in bathroom and kitchen sinks can be reduced either with a flow restrictor or by closing the shut-off valve under the sink until flow is reduced to 1 gallon per minute when the faucet is all the way on. To measure the flow rate, put a 1 gallon container under the faucet and time how long it takes to fill.

If you have a dishwasher, however, it is not advisable to adjust the hot water shut-off valve under your kitchen sink, since it might restrict flow to the dishwasher as well.

Timers can save you money if they limit the amount of water that is heated or if they reduce system heat losses. System heat losses are reduced only if the timer is set so that the element shuts off right after the hot water is used and before the cold water entering the tank can be heated. If an insulating jacket is installed and the water temperature is reduced, the effect of the timer is not as great.

Estimated Savings: Flow controls can save up to 40 KWH per month for a family of two. Timers can save up to 20 KWH per month if they limit heat loss from the water heater.

**Water Heater Efficiency**

**Jackets**

A full tank of hot water radiates about the same amount of heat as a 75 watt light bulb. If the water heater is in an air conditioned area, this heat loss adds to the cost of cooling air in addition to adding to the cost of heating water.

If the water heater is reasonably accessible, installing a simple insulation jacket can cut losses by more than half. You can buy a water heater insulation kit for about $20, or make one yourself out of insulation blankets. When insulating the water heater, do not cover up the wiring access plate or the drain spigot. Take special care with gas water heaters; insulating them may be dangerous.

**WATER TEMPERATURE**

Water heater thermostats are frequently set between 140° and 160°F when 110° to 120°F is often adequate. The setting should be above 120°F only if the dishwasher does not satisfactorily clean the dishes.

Before resetting the thermostat TURN OFF THE POWER TO YOUR WATER HEATER, remove one or two screws holding the access panel, and peel the insulation aside to expose the thermostat. Use a small screwdriver to reset the thermostat to the desired setting. There will be two thermostats if your water heater has two elements. The setting of the lower thermostat should be 10°F less than the setting of the upper thermostat. Replace the insulation and the cover before you turn the power back on.

**Piping Insulation**

The hot water pipe is, in most cases, the smallest diameter pipe connected to the heater. On most water heaters the hot water outlet is labeled. If this pipe rises up from the heater and goes across the ceiling in an open space, it is a worthwhile investment to insulate the pipe. Your local hardware or plumbing supplier can provide you with pipe insulation.
GAS WATER HEATERS

If you have a gas water heater, combustion air is critical, and the burner should be adjusted annually. The flues in the water heater should also be thoroughly cleaned and inspected annually.

Estimated Savings: A temperature reduction of 20°F can save up to 25 KWH per month per occupant. A jacket can save up to 30 KWH per month.

WHILE YOU ARE AWAY

The recommendations in this section can be useful whether your condominium is unoccupied for a few hours per day or for 11 months of the year.

Reducing Air Conditioning Costs

Running an air conditioner for 2 hours per day in a closed, unoccupied dwelling will prevent mildew problems. Timers or humidistats provide reliable control of operating time, whereas setting the thermostat to a high temperature produces unpredictable results.

TIMERS

Timers can be set to turn the air conditioner on and off at desired times. A timer set to allow the air conditioner to run from 5 a.m. to 7 a.m. when the condominium is unoccupied can save several hours per day of unnecessary operation.

Money can be saved whenever an air conditioner is turned off — even for periods as short as 1 hour. It is a good practice to turn off your air conditioner when you leave and turn it back on when you return. It takes a surprisingly short time to lower the temperature back to a comfortable level.

HUMIDISTATS

Humidistats turn on the air conditioner if the humidity exceeds a predetermined level. They are somewhat easier to install than timers, but are also easier to operate improperly. If a humidistat is set too low or not properly calibrated, it will cause the air conditioner to run too long, and the electric bill will be high.

DEHUMIDIFIERS

A dehumidifier is merely an air conditioner that cools the air passing over its coil in order to remove moisture, and then reheats the air. The air leaving is warmer than the air entering, but has less moisture content.

Since dehumidifiers can lower the humidity in warm, moist Florida condominiums, they are useful for mildew control. However, if you already have an air conditioner, it will usually give better humidity control. If it is on a timer, it will cost less to run than a dehumidifier. Using an air conditioner for humidity control eliminates both the need for providing a drain for the dehumidifier and the need for a place to store the dehumidifier when it is not in use.

Estimated Savings: A 1 1/2-ton air conditioner running 2 hours per day uses about 180 KWH per month. If everything else is turned off, this amounts to $10.80 per month (at 6 cts per KWH). Under the same conditions, a 2-ton unit would cost $14.40 per month to operate. In many cases, a timer or humidistat will pay for itself in less than a month.

While you are gone, standing water in drains and commodes will evaporate and add humidity to the air. Also, when there is no water in the drain trap, sewer gas may seep through the pipes and add odor to the air. "Sealing" the water will help prevent these problems.

Sealing can be performed by pouring a very small amount of oil on the surface of the water so it does not evaporate. The use of non water soluble mineral oil, lubricating oil, or even suntan lotion may accomplish this purpose. To determine how much to use, put a couple of drops in the commode and see if the coating covers the entire surface. Put in enough so that there is an oil film over the whole surface rather than just a few spots. Then take about half of the amount you used in the commode and put it in each of the drain-traps.

Reducing Water Heating Costs

Your water heater uses about 50 KWH per month, even when hot water is not being used. Turn it off whenever you are away for more than a few days.
Reducing Refrigeration Costs

Your refrigerator probably uses between 100 and 200 KWH per month. When possible, empty the refrigerator, turn it off, and leave the door(s) open. It is much more economical to give away some food to friends than to pay $12 per month to keep it cool.