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Save Home Energy

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Energy-Efficient Apartments

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Continuing increases in energy costs and fewer apartment complexes boasting "all bills paid" cause smart renters to look for energy-efficient units.

More energy is used for air conditioning than for heating in most parts of Texas; therefore, it is important to look for an apartment that will require lower costs for cooling. In the cooler parts of the state, special consideration may need to be given to reducing heating costs.

Evaluate Energy Efficiency

Use this check list to evaluate the energy efficiency of apartments in Texas.

ENERGY-SAVING FEATURES	YES	NO
1. Largest exterior wall faces south?	_____	_____
2. Apartment is between others rather than on the end?	_____	_____
3. Apartment is located on mid or lower level?	_____	_____
4. Exterior walls and roof are light in color?	_____	_____
5. Exterior walls are protected by trees or roof overhang?	_____	_____
6. Largest windows and glass areas face south?	_____	_____
7. Glass areas are protected from summer sun?	_____	_____
8. Windows can be used for cross ventilation?	_____	_____
9. Doors and windows have screens?	_____	_____
10. Doors and windows are caulked and weather-stripped?	_____	_____
11. Economical fuels are used for heating/cooling?	_____	_____
12. Heating/cooling equipment is well-maintained and filters changed on a regular basis?	_____	_____
13. Cooling equipment is protected from sun?	_____	_____
14. Fireplace has a tight-fitting damper?	_____	_____
15. Water heater is located close to kitchen and bathroom?	_____	_____
16. Dishwasher can be stopped to air dry dishes?	_____	_____
17. Refrigerator can be manually defrosted?	_____	_____
18. Range and bathroom exhaust systems are vented to the exterior?	_____	_____
19. Floors are carpeted or rugs can be safely placed on floors?	_____	_____
20. Windows have roller shades or tight-fitting drapes?	_____	_____

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After answering each question, evaluate the importance of each NO answer and its relationship to how much energy could be saved. Also, consider how well the apartment measures up to family likes, the amount of rent and the apartment's proximity to work and schools. Before signing a contract, ask residents about their average energy use during summer and winter.

Investigate Energy-Efficient Features

Some units are more energy efficient to live in than others. Location of an apartment within a complex is the first key to finding one that is energy efficient. Renters rarely find complexes where additional insulation or storm windows have been added.

Be sure the largest exterior wall faces south. Apartments with major exposure to other directions will use more energy.

While end units are more private, they require more energy for year-round heating and cooling because an exterior wall is exposed to the outside elements.

Ground-level apartments consume less energy than those on top floors because another living area serves as the roof. A mid-level unit has protection from unwanted air movement through floors and ceilings. Research shows that in summer the second story of an apartment complex will be 10 to 15 degrees hotter than the ground floor.

Apartment complexes with dark-colored exteriors absorb more year-round solar heat. If living in an area where summer heat is a problem, light-colored exterior walls and roofs are an important consideration. Light colors reflect heat and the apartment naturally will be cooler in summer.

An apartment protected by deciduous trees, those that lose their leaves in winter, can reduce energy usage, especially when the trees are located on the east and west. Evergreen trees or buildings on the north side give winter wind protection. Grassy or foliage-covered areas near the building on the east, west and south sides reflect solar heat and keep exterior walls cooler in summer time.

Units with large unprotected glass areas facing east and west require more energy for cooling, especially on hot summer days. Wide overhangs on the east and west sides of the unit help provide some protection from the sun's rays.

Windows that open allow the advantage of cross ventilation. Check to see if all windows are easy to open and notice if a breeze is blowing. Cross ventilation is possible if windows are located in the direction of natural breezes and there is another exit for the incoming air. Often sliding glass doors onto a balcony or patio provide the exit needed for cross ventilation.

If there are no screens on doors or windows, ask the manager if there are plans to install them or if tenants are allowed to install screens at the owner's or tenant's expense.

Once an apartment has been selected within a complex for its exterior energy efficiency, check before renting for ways energy may be lost within the unit. Check the condition of caulking and weatherstripping of doors and windows. Be sure the door frame is caulked or sealed where the siding and frame are joined. Areas around all windows should be caulked. Caulking should not be cracked or falling out.

Look to see if the interior door frame has weatherstripping in good condition. The threshold should be in good condition to keep air from moving in or out under the door. If any light can be seen coming through at the sides or bottom of the door, the weatherstripping is not doing its job.

Inspect to see if each window is weatherstripped. Most aluminum windows have built-in weatherstripping. An accumulation of dust on sills indicates the weatherstripping is not working effectively.

Heating and cooling an apartment consumes the largest portion of the energy costs. Refrigerated air conditioning units cost more to operate than evaporative coolers. Expect adequate cooling from evaporative units in the dry climates of Texas only.

If the manager or a representative is showing the apartment, ask to see where the heating and cooling equipment is located. An interior location for single-unit equipment is an advantage when renters pay the utility bills. If the apartment has a split-unit, the compressor for the refrigerated air conditioning system is located outside. Check to see if the compressor is protected from hot summer sun and free of trash, vines or debris. Compressors kept clean and protected from the sun use less energy.

Ask where the heating and cooling system's filter is located and check to see if it is clean. Always ask about the maintenance policy on the equipment, especially if the filter is dirty. Tenants may be responsible for replacement of filters. Equipment should be checked and serviced at the beginning of each season by the owner/manager or a qualified serviceman.

If the apartment has a fireplace, ask the manager and residents if it produces much heat and if the damper fits tightly. Fireplace units placed in apartments are usually factory-built and operate in much the same manner in each unit.

Next to heating and cooling systems, water

Select an energy-efficient apartment location — facing south, on the ground floor, away from the end of a wing. Trees and foliage help to give protection. Windows that open allow cross ventilation. Large glass areas need protection of wide overhangs, especially on the east and west sides.

heating is the second largest user of energy, representing about 15 percent of the energy budget. Ideally, the water heater should be located close to the kitchen and bathrooms. Energy is wasted if hot water has to travel a long distance from the water heater.

A dishwasher uses approximately 13 to 16 gallons of water for a normal cycle. Its main operating cost lies in the use of hot water. Look for dishwashers with an energy-saving drying cycle that eliminates the use of heat during the drying cycle, saving 20 to 40 percent of the dishwasher operating costs. If the model does not have a separate energy-saving switch, be sure the dishwasher can be manually stopped to allow dishes to air dry.

Refrigeration is the third largest energy consumer in the family budget. Refrigerators are furnished in many apartments. The frostfree types use almost 50 percent more energy to operate than manual defrost models. Any savings will be lost if frost is allowed to accumulate to more than ¼-inch thickness. Ice on the coils acts as an insulator, cuts down the efficiency of the

evaporator and forces the motor to run a higher percentage of the time. Determine if the refrigerator is frost-free by looking at the temperature dial. The words "DEF" or "Defrost" indicate the freezing compartment must be manually defrosted. Refrigerators with features such as an ice-maker, cold water dispenser or ice-cube dispenser and three door models require more power to operate.

Exhaust fans over the kitchen range and in the bathrooms help control moisture problems if they are vented to the outside. When these vents are used, air conditioning loads are reduced.

The amount of carpeting and its color influence on the amount of energy consumed. Carpeted floors are warmer to walk on and provide some insulation value for floors. A dark-colored carpet makes the apartment seem warmer but also smaller. A light-colored carpet makes rooms seem cooler and larger. The color and texture of walls and wallpaper also affect whether residents feel warm or cool in the apartment.

Window treatments used in an apartment affect energy usage. Large glass areas are real energy wasters and the effectiveness of window treatments in reducing solar heat gain is important. A tight-fitting, white, opaque roller shade reduces heat gain up to 50 percent; white, translucent shade up to 44 percent. White, lined draperies cut as much as 33 percent of the heat gain and closed venetian blinds 29 percent. The ideal window treatment reduces summer heat gain as much as possible and allows winter sun to shine in.

Fluorescent lighting uses less energy than incandescent light fixtures. Because renters are usually responsible for replacing bulbs and most apartments contain incandescent lighting, look for fixtures which allow the use of fluorescent convertors.

Furniture also affects the amount of energy used. Dark, plush upholstered goods used in combination with dark, massive case goods make rooms seem warmer. Shiny metals or light-colored furniture covered with glossy paints create the feeling of coolness and spaciousness.

Ideally, in Texas an energy-efficient apartment is located at mid or ground level, the largest exterior wall faces south, has a light-colored roof and exterior, is protected by shade trees and allows for cross ventilation to take advantage of natural breezes. Of lesser importance are the types of appliances, furnishings, floor and wall coverings (including their colors), the types of window treatments and the lighting system.

Remember, to rent an energy-efficient apartment, check the location within a complex, the number and exposure of windows, the condition of caulking and weatherstripping and the location and condition of heating and cooling equipment.

Increase Energy Efficiency

Renters have four alternatives when faced with an apartment that is an energy waster. The first thing to do is to discuss problems with the management.

- Ask the management to correct energy-wasting problems.
- Correct problems yourself with management approval.
- Move to another, more energy-efficient apartment.
- Reduce energy consumption at present location through a change of energy-wasting practices.

NO-COST MEASURES TO REDUCE ENERGY WASTE

Heating and Cooling System

- Keep thermostat at minimum comfort setting. Turn the system off at night or when the apartment is unoccupied. Actual savings depend on the weather, but this is the biggest chance for savings.
- Close off rooms that are not in use. If too many rooms are closed off, refrigerated cooling equipment will not adequately remove moisture from the air.
- Keep permanent filters on heating and cooling equipment clean. This can bring a 10 percent gain in efficiency.
- Close the damper in the fireplace when fire is out. Seal off the fire box during the summer to prevent loss of cool air and gain of hot air.
- Turn off a gas furnace's pilot light and gas supply in warm weather. For safety, the gas company should do this.
- Use natural ventilation through open doors and windows whenever possible. Keep draperies and window treatments closed on hot summer days; open on warm sunny days during winter.

Heating Water

- Set water heater thermostat at 140°F if the unit has a dishwasher; otherwise, set at 120°F. Savings will depend on the amount of temperature reduction.
- The amount of water used for a tub bath vs. a shower depends upon the flow rate, the length of time the shower is running and how full the tub is filled. A typical bathtub filled to overflow holds 25 gallons of water. A conventional shower running at full force

may use 3 or more gallons of water a minute, but a showerhead designed for low flow rate may use as little as ½ gallon per minute. A short shower at a low flow rate will use less water than a typical tub bath.

Washing Dishes

- Avoid partial dishwasher loads; fill according to manufacturer's instructions. Turn off the unit and open the door at the end of the rinse cycle. The cost of electricity used to dry dishes will determine the savings.
- With hand washing of dishes, avoid letting hot water run continually for rinsing.

Top-of-the-Range Cooking

- Match size of pan to the unit or burner.
- Use a minimum amount of water for cooking.
- Use pans with straight sides, flat bottoms and tight-fitting lids.
- Keep reflector pans or bowls shiny clean.
- Turn off electric units a few minutes before cooking is completed.
- Pressure cooking cuts cooking time and energy use by at least one-third when compared to conventional methods.

Oven Cooking

- Use oven to prepare double or triple batches of food, or an entire meal.
- Pre-heating the oven is unnecessary unless preparing foods that contain leavening agents.
- Don't be an oven "peeker."
- Keep seal around the oven door clean and in good repair.

Refrigerator — Freezer

- Vacuum the motor housing and the condenser coils of a refrigerator 3 or 4 times a year. Dust, dirt and animal hair will trap heat and act as an insulator on the condensor coils.
- Defrost before build-up reaches ¼ inch. Ice on the coils acts as an insulator, cuts down the efficiency of the evaporator and forces the motor to run a higher percentage of the time.
- Keep refrigerator full; when half-empty, the appliance uses more energy because air is harder to keep cold than chilled foods.

Small Appliances

- Small cooking appliances often require less energy than a cook stove. Substitute small appliances for a range for some cooking jobs. Electric fry pans, toasters, toaster ovens and coffee makers use less energy than an oven.
- Air dry your hair whenever possible. When it is necessary to use an electric dryer, towel dry your hair as much as possible.
- Keep the vacuum cleaner efficient by emptying or replacing the bag as instructed by the manufacturer. Clean attachments after each use.

Television

- Turn off the "instant-on" switch on the TV set or add a switch between the set and wall socket. "Instant-on" settings have current running through some circuits even when the set is turned off.

Decorating

- Use light, cool colors on walls, carpets, furniture and window treatments during summer; add warm, dark colors as winter accessories to create a warmer atmosphere.

Lighting

- Do not turn on unnecessary decorative lights. Avoid long-life light bulbs, except in inaccessible places. Long-life bulbs use more energy.

LOW TO MODERATE COST MEASURES TO REDUCE ENERGY WASTE

Heating and Cooling Systems

- Have heating and cooling equipment cleaned and adjusted once a year. Annual savings of 10 percent can be realized.
- Replace disposable furnace/air conditioning filters every 4 weeks during heavy usage.
- Install an inexpensive timer to automatically shut off heating and cooling systems at night and turn the units on in the morning. Substantial savings can result, but will vary with families.
- Install aluminum foil behind radiators to send heat back into the room.

Caulking and Weatherstripping

- Weatherstrip and caulk doors and windows. The cost and savings will depend on the size of unit and openings.

Heating Water

- Fix leaky faucets, especially hot water faucets. Leaks can waste 600 to 6,000 gallons of water a year.
- Add layer of non-combustible insulation around the outside of the water tank. For a typical gas-fired heater, omit insulation at the top of the tank and around vents or openings leading to the burner compartment. The investment can be paid back in less than 5 months.

Lighting

- Substitute fluorescent adapters for incandescent lights where possible. A 25-watt fluorescent bulb has the same light output as that of a 100-watt incandescent bulb.

Appliances

- Make sure refrigerator and freezer gaskets are air-tight; if not, replace gaskets.

Window Treatments

- Make or purchase inexpensive plastic storm windows. Install storm windows ¾ inches to 2 inches away from window glass, either inside or outside.
- Make or purchase inexpensive liners to hang on existing drapery hooks.
- Install white opaque or reflective roller shades to windows. A decorative fabric can be laminated to the side facing the room. A 50 percent reduction in solar heat gain will result.
- If agreeable to management, install reflective sun films to glass areas.
- Plant rapid-growing vines in large pots outside windows to shade windows.

Moving to another apartment is often the only way to improve ventilation, exterior and interior colors and shade trees. If a move within the same complex is not possible, move to another complex.

For additional information on how to carry out energy-saving practices and projects contact your local county Extension office.

References

Energy Conservation Manual, Part 2, Apartment and Non-residential Buildings. State Building Commission, Austin, Texas, 1976 (revised).

Felmer, William III. *Energy Conservation With Nature's Growing Gifts*. American Association of Nurserymen, 1976.

Neubauer, Loren W. "The Semi-Solar Low Cost House Saves Energy Through Environmental Orientation." Proceedings of International Symposium on Housing Problems, International Association for Housing Science, May 1976.

Save Energy, Save Dollars — Energy Efficiency in Major Appliances. Cooperative Extension Service, Ithaca, New York, 1977.

Thermal Performance Guidelines for One and Two Family Dwellings. National Association of Home Builders, Washington, D.C., 1977.

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