



HOUSING

Energy-wise decorating

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Quick Facts...

The home has much potential for conserving energy.

An energy-conscious attitude toward home furnishings and decorating will enhance the savings realized through other conservation practices.

Decorating and home furnishing choices that have the greatest influence on energy use fall within four major areas—use of design elements, wall and floor coverings, window treatments and lighting.

The home has much potential for conserving energy. Among the most effective conservation measures are insulating, caulking, weatherstripping and protecting glass areas. Such measures provide for a substantial savings in energy and should be incorporated into the home conservation program. Other general conservation practices, such as keeping doors closed, turning off lights and using less hot water, also can help a great deal in the effort to save energy.

One additional measure that will enhance the savings realized through other conservation practices is an energy-conscious attitude toward home furnishings and decorating. This does not necessarily mean you need to redecorate your entire home to bring about this additional energy savings. Many steps can be taken with the furnishings you already have or with very little money invested.

Decorating and home furnishing choices that have the greatest influence on energy use fall within four major areas: use of design elements, especially color, texture and space; wall and floor coverings; window treatments; and lighting.

If you do plan to remodel or redecorate soon, consider the following points to help you achieve a more energy efficient decor.

The Design Elements

The design elements are the basic components of every art form. How these elements are selected and used can greatly influence not only the visual appearance of a room but physical sensations as well.

To decorate in an energy-conscious way means to create an atmosphere, through finishes and furnishings, that will make the occupants feel comfortable in accordance with the weather outdoors. In the hot weather season, the goal is to make a room feel cool and refreshing. Colder weather calls for a warm and cozy atmosphere.

Let us examine three design elements--color, texture and space--to see how they influence thermal comfort in a home.

Color

Color not only affects actual room temperatures, but can create psychological thermal sensations as well.

Dark-colored surfaces and furnishings absorb light and solar heat. Because they absorb solar heat, dark colors help warm up a cool room on a sunny day. Be careful not to use too many dark surfaces, however, since they also absorb valuable light, making rooms seem darker and smaller. More artificial light will then be needed, increasing energy use.

Light colors on the other hand, allow minimal amounts of solar heat to be absorbed. Such colors are well suited to an area of the home that becomes

overheated in the warmer months. Since light colors also reflect light rays, they tend to visually increase the size of a room and lessen the need for artificial illumination.

Psychological sensations of temperature come from the colors selected. Cool colors--blue, green and violet--create a cool feeling and are best used in southern, sunny rooms or during warm months. Use warm colors--red, orange and yellow--in areas with a north or "cool" exposure to make the room appear warmer. (Figure 1). If you have a strong preference for cool or warm colors in your decorating scheme, try to select variations of your favorite colors that lean toward a "cool" or "warm" feeling, depending on where they are used in the home. Preferred colors can also be introduced as accents, bits of color, in a room.

Texture

The textures used in a home can influence thermal comfort. Always have some variety in the textures you use to add interest to the room, but a predominance of any one texture can create a cool or warm feeling.

Smooth surfaces—glass, plastic, high gloss paint, mirrors, etc.—look and feel cold. If used alone in a room, they can create a hard, chilling feeling that is not very comfortable on a brisk winter day. These textures also reflect light so are beneficial in creating an illusion of space and for maintaining or increasing light levels.

Heavy textures used in upholstery, on walls or on the floor look and feel warmer than smooth surfaces. The highly textured surfaces seem cozy and inviting on cool days and their heavy nap tends to trap warm air, releasing it later to warm the room and its occupants. Such textures also absorb light so overuse can reduce light levels in the room.

Space

Space planning and distribution can affect comfort in a room through the way furnishings are arranged and air flow is directed. When furnishing a room, be careful not to block or interrupt the flow of warm or cool air from registers, furnace or vents.

Cool weather calls for a cozy, warm feeling that can be achieved by filling space visually with color and texture, or physically with furnishings. Open and airy spaces work best for warmer weather, because air can circulate more easily throughout the room. A careful selection and use of furnishings and finishes can help to create that open feeling.

Choosing and Arranging Furniture

When selecting furniture for thermal comfort, first determine where the furniture will be located in the home. Are you furnishing a warm sunny room or a cool shaded room? Then consider color, style and cover to help you make the best choice.

For cooler rooms and cool weather, select chairs that close in around the body such as overstuffed or wing chairs. They will give more protection from drafts and trap warm air around the body. Choose napped, textured or pile fabrics for these furniture pieces since they are warmer than smooth textures, especially vinyls and leather. Heavy textures absorb and trap body and solar heat making them feel warmer to the touch. They also store heat that will emit into the room during the day.

In warm, sunny rooms or during hot weather, open-styled furniture pieces that allow air to circulate feel cooler to sit in. Choose fine- to medium-textured and absorbent fabrics that stay cool to the touch and absorb body perspiration. The transfer of heat from the skin to these fabrics takes longer so they stay cool. Avoid plastic, vinyl and leather covers. They do not "breathe" or absorb perspiration and feel sticky and uncomfortable during hot weather.

Now, choosing furniture and fabric for a sunny or shaded room may be easy, but what do you do about the furniture you already have or for rooms that change with the seasons?

The solution is to make use of slip covers or throws. Furniture pieces can be purchased with versatile covers, or you can make covers to fit the pieces you already have.

If you have a sofa covered in a dark, heavily textured fabric, make a crisp cotton cover in cool summer colors to use during warm weather. For cooler months, cover those cool fabric furniture pieces with napped covers in warm colors. It is especially important to cover plastic, vinyl and leather pieces since these surfaces are very cool feeling during cold weather and become uncomfortably “sticky” in hot weather.

Well-planned furniture arrangements also are important for thermal comfort throughout the year.

First of all, be sure furniture pieces do not block furnace vents, radiators or cold air vents. Allow heated or cooled air to circulate freely. Deflectors may be necessary in some rooms to help direct the warm or cool air flow.

As mentioned, a proper use of space is very important for making a room feel comfortable and furniture fills much of a room’s space. A cozy, close arrangement of dark, heavily textured pieces with lots of pillows and accessories gives a warm, cozy feeling during cooler weather. We tend to feel warmer when things seem closed in around us.

To take more advantage of solar heat, place the heavy, dark and bulky pieces near a sunny window to pick up the sun’s warmth during cooler days. If possible, push the pieces into the room away from the windows and outside walls so they can emit the warmth into the room during the cooler evening hours. Keep in mind that some upholstery fabrics fade and/or deteriorate very quickly in direct sunlight. Consult the manufacturer’s label for fiber content before exposing the piece to sunlight.

In the summer months, separate the furniture to give an open, airy feeling and let air circulate well. Use only the pieces you need to keep from overcrowding the space. Eliminate clutter by using only selected accessories and keeping table tops clear.

Energy Tips for Walls and Floors

Wall and floor coverings can affect a room’s comfort through their color and texture, but they also can be a means of adding extra insulation. Consider both appearance and insulating qualities when choosing energy conscious floor and wall coverings.

Carpet looks and feels warmer than hard-surfaced floor coverings. The carpet’s lofty texture traps warm air and makes it feel warm to the touch. Hard, smooth surfaced materials such as vinyl, terrazzo, brick and quarry tile will seem cooler year round than wood or carpet. On the hard surfaced floors, make use of throw and area rugs to add warmth in the cooler months. Replace the rugs with reed or fiber mats during warm weather for a cooler look and feel.

Color also can be a factor in flooring. Dark colors absorb the sun’s rays more than light colors, adding extra warmth to the room. Remember, however, that dark colors darken a room and increase the amount of artificial light needed.

Floor covering materials help insulate against winter heat loss, especially in single story homes with a concrete slab floor or uninsulated wooden floor over a crawl space. In a one-story home, the combination of carpet and padding cuts heat loss through the floor by as much as 72 percent on the uninsulated concrete slabs and as much as 54 percent on wood floors over a vented crawl space. The actual amount of money that can be saved depends on location, shape and size of the house, local fuel rates, seasonal degree days and type of floor covering used.

Other Energy-Saving Decorating Ideas

Consider these additional ideas to help save energy when decorating.

Plants can be beneficial to a room all year around. Besides adding color and interest, plants provide moisture for the room. A humidity level of about 30 percent makes air feel 2 to 3 degrees warmer. Plants also give a cool, fresh look to the home in the summer.

Fireplaces are nice, but can be very inefficient. When you want to allow a fire to burn down after you have gone to bed, use a glass door on the fireplace to keep warm air in the home from escaping up the chimney. If you decide to add a fireplace to your home, select the most efficient model and one with an outside air feed. You may want to consider a wood burning stove.

Add extra insulation to outside walls through selected furnishings and wall modifications. Plan built-in closets along those walls. The clothing or items stored in the closet will insulate the wall. Also keep the closet doors closed so cold air does not escape. Cover the walls with bookcases so books and other contents can serve as insulation. Hang large rugs or tapestries for decoration and insulation.

As families adjust their everyday living patterns for better use of energy, it still will be possible to enjoy the beauty and comfort of the home environment. The key is to begin thinking in terms of those small energy-saving changes when planning interior design improvements.

The insulating value of a floor covering varies with the materials selected. Bulky and heavily textured materials usually have a higher insulation value than smooth, compact ones.

Carpets and rugs are good floor insulators, and the addition of a pad will further increase the insulating value. Generally, the thicker and denser the carpet, the better insulator it is. Wool and acrylic provide the best insulation, while nylon is the least effective.

Wall-to-wall carpet laid over a pad has a greater insulating value than area or room-sized carpets or rugs. Also try using carpet on outside walls to add interest and extra insulation.

Resilient and hard floor coverings provide a minimal amount of insulation when compared to carpet. Some, however, have a cushioned backing that gives the floor covering more bounce or resiliency, and adds an extra layer of insulation at the same time.

Further increase the thermal comfort of a home by carefully selecting wall treatments. Dark, textured wall coverings close in a room, creating a warm, cozy feeling. Light colored and glossy mirror-like finishes reflect light and give the room a cool appearance.

Wall treatments also can be good insulators. Besides the carpet wall mentioned previously, other products and procedures have been developed to increase the insulation value of interior wall treatments. This added insulation is especially important on outside walls.

One insulating wall product is a wall covering liner. Its main function is to smooth out walls before wall coverings are added, but it also serves as a layer of insulation. Insulating paints and plasters are now on the market. If you plan to panel a room, take advantage of the opportunity to add a layer of insulation behind the paneling. Fabric walls with a cushioned or upholstered look have a layer of polyester fleece between the fabric and the wall that provides added insulation.

Energy Efficient Lighting

Even though home lighting makes up only a small part of the home's energy costs, a savings can be realized through proper lighting selection and use. Don't skimp on light, however, because adequate lighting is needed for task areas and safety.

Make greater use of fluorescent lights when possible. Fluorescent lights are more efficient than incandescent bulbs producing more lumens per watt. One 40-watt fluorescent tube gives more light than three 60-watt incandescent bulbs, saving you about 45 percent on lighting costs. Fluorescent lamps give off 80 lumens per watt, while incandescent bulbs give off only 14.7 lumens per watt; thus fluorescent lights give three to four times more light than incandescent. Another advantage of fluorescent lights is that they last seven to 10 times longer than incandescent bulbs.

Be aware of the fact that fluorescent lighting usually gives a cool coloring to the room, and may give a flat look to the furnishings. Try fluorescent lights in your room before installing them to see if you like the effect they give. Fluorescent lights work very well in work areas where coloring is not so important.

Where incandescent bulbs are needed, use one large bulb rather than several smaller ones. For example, one 100-watt bulb gives off approximately the same amount of light as two 60-watt bulbs, while using less electricity. Long life bulbs are best used in hard-to-get-at places because a standard life bulb uses less electricity, giving the most light for your lighting dollar. Use three-way bulbs in lamps. A high level can be used for reading and lower levels will be sufficient for conversation.

Turning off lights does save energy; however, frequent switching on and off shortens the life of a bulb. Make it a practice to turn off incandescent lights if you are leaving a room for three minutes or more; turn off fluorescent lamps if you leave for over 15 minutes. With the new, improved ballasts on some fluorescent lamps, manufacturers recommend turning them off if leaving for over 5 minutes.

Sources of Information

Living With the Energy Crisis, Cl.5, Small Homes Council, Urbana, Ill.

Window Planning Principles, Fl. 0, Small Homes Council, Urbana, Ill.

Save Energy Save Dollars, Information Bulletin 125, New York College of Human Ecology and the New York State College of Agriculture and Life Sciences, Statutory Colleges of the State University at Cornell University, Ithaca, N.Y. 1977.

Some practices may save on lighting costs indirectly because they help to increase light levels. Light colors and smooth textures reflect more light, therefore reducing the amount of artificial light needed. Keep light fixtures and bulbs dust free to allow full illumination. Dust can reduce the amount of light by 20 percent. Also change bulbs when they become dark and use the old bulbs in closets and other seldom used places. Replace dark, opaque shades with white or near white shades that allow light to come through the shade material. They give greater light distribution.

Energy Saving Tips for Windows

Making use of energy-saving window treatments is of major importance since much of the heat loss and heat gain in the home takes place through window and glass areas. Most insulated walls in today's homes have an R-value of approximately R-13. In contrast to that, a single thickness of glass has an R-value of .89. By adding a second layer of glass for double glazing, you can increase that to R-1.81, a substantial increase. Providing triple glazing boosts the value to R-2.79. These ratings are still below that of a wall, but through the use of multiple panes of glass, exterior shading and well-designed interior treatments, heat gain and loss can be kept to a minimum.

The greatest protection against solar heat gain is achieved through exterior shading including the use of awnings, overhangs and trees. Proper selection of interior treatments can further enhance the protection against solar heat gain, plus add protection against internal heat loss.

Use window treatments to take advantage of natural lighting, heating and cooling. Admit light and solar heat during winter daytime hours and close off the windows after sundown to keep out cool night air. In the warm summer months, protect glass areas on the sunny sides of the house from solar heat gain during the day and open windows at night to let in the cool night air.

The choice of window treatments available today is large in number and quite varied in design. Before making a selection, study your own situation carefully before you make your decision.

Depending on the type, treatments may be effective for only one season, or may provide protection all year around. The latter is preferred, of course, since no change or only minor changes will need to be made at the end of each season. Other things to consider include the appearance, cost, ease of use, and energy-saving potential.

No matter what your choice, be sure you do not block cool or warm air vents. If a vent is located immediately under a window, use shorter window treatments and/or install a deflector to direct warm air out into the room and not up onto the window's surface.

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