Energy Facts

Landscaping for Energy Conservation - Benefits and Important Considerations

Landscaping can help conserve energy as well as beautify your property. During the summer, properly placed trees and shrubs can help reduce cooling costs. In the winter, well-placed landscaping can reduce home heat loss by blocking cold winter winds. Additional benefits can be realized by selecting plants that are relatively pest free, and by designing a landscape that requires less water and fuel use to keep it attractive.

The four main goals of energy conservation landscaping in Michigan are:

1. Maximize the amount of heat obtained from the sun during winter.
2. Maximize shade during the summer.
3. Protect buildings from winter winds.
4. Channel summer breezes toward the home.

When considering the purchase of plants to use in landscaping, please remember that good quality plants are essential for horticultural success. Weak-wooded trees, pest prone plants, trees that produce hundreds of volunteer seedlings, or trees that continuously shed branches will end up creating work for the homeowner. This fact sheet concentrates on plant placement; however, plant selection is just as important.

Is Landscaping for Energy Conservation Worth the Effort?

A well-designed landscape that includes well-placed trees can save 25% of a household's energy consumption for heating and cooling. Computer models developed by the U.S. Department of Energy predict that three properly placed trees will save an average household between $100 and $250 in annual energy costs.

Consider that a young, eight-foot shade tree may cost about as much as an awning for a large window. As the tree grows, it will shade far more than a single window and will provide hundreds of dollars of savings during its useful life. Deciduous trees provide summer shade and then lose their leaves in the autumn. This allows the sun to shine on the house and provide winter warmth. The combination of shade and evapotranspiration (the process a plant uses to release water vapor for cooling) can reduce air temperature as much as 9° F.

Well-placed shade trees can result in considerable savings in energy for air conditioning. As compared to an unshaded home, a shaded home may have from 15% to 50% reduced energy cost for cooling. The figure will be higher for residents of mobile homes.

In winter, the ability of plants to block the wind will reduce air infiltration into homes. Such air leaks can account for as much as a quarter of the heat loss in the average home. Blocking winter winds can save energy used for home heating by 10% to 40% depending on the study and the degree to which plants were used to block the wind.

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Additional benefits from a well-designed landscape include dampening the sound from nearby roads or other sources of noise. Plants also remove particulate matter from the air and help control soil erosion, which helps reduce pollution.

Important Considerations

To derive maximum benefit from energy conservation, a home must have the proper orientation relative to the sun's path across the sky. In general, the longest dimension of a home should be oriented in an east-west direction. This will expose the largest amount of wall area to warming, winter sun. Try to have fewer windows in the west and north facing walls to reduce the amount of cold infiltration during the winter. When possible, save existing trees during construction so that they can provide immediate energy conservation benefits.

Develop a plan for the landscape around your home. Include all the existing features and plants and note the location of windows. Make sure the locations of underground utilities have been included. Then use arrows to show sun angles and the direction of prevailing winds for summer and winter. This will help determine which areas need summer shade and where windbreaks should be planted. Also, note the location or source of noise that could be blocked or reduced by landscape plantings.

A landscape is an extension of the indoor space. Note frequent use areas such as play areas for children, storage areas, areas dedicated to pets, and other uses. Make sure that landscaping installed for energy conservation does not block views that are important to the family.

Give yourself a year to complete your plan. This provides the opportunity to see how wind and sun affect your home in all four seasons. Make notes on the plan about the weather characteristics you would most like to modify. This will help set priorities when determining exactly which energy conservation choices you will incorporate into your landscape.

Selecting Plants

It may be tempting to use fast-growing trees to get quick shade. But many fast-growing trees tend to be weak-wooded and are prone to serious pest problems. Such trees should not be planted near homes or other buildings. Planting a few larger and higher quality trees in key locations in the landscape may shorten the time until the plants can provide energy savings.

Select plants that are adaptable to your growing conditions. If the soil is dry and sandy or heavy and wet, use plants that tolerate those conditions. Most nurseries and garden centers have a sufficiently large choice of plants so that any set of growing conditions can be met.

Pest resistance should be a concern for all the plants selected. Some pest problems only occur when plants are older and have begun to provide energy conservation benefits. Having to spend time and money to control a problem that could have been avoided will not save time or energy.

Consider the maintenance level of the landscape. A high quality lawn may require regular fertilization, watering, and mowing. Using ground covers or mulch may provide an alternative while reducing work and energy usage. Allowing the lawn to go dormant in summer rather than trying to keep it green and growing will reduce energy usage.

Consider plant interactions. A very shady landscape will help keep the house cool but it will be almost impossible to have a high quality lawn in the shade. Also, not all shrubs and flowers will grow in the shade; consequently, the range of plants to choose from will be smaller.

Try to mix in plants that flower at different times of the season, have bright fall foliage color, or have ornamental fruits. A landscape that helps conserve energy can still be a source of enjoyment and beauty.

Sources of Information:

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