

Landscaping for Energy Savings

Compiled by staff of the WSU Extension Energy Library

Last updated: December 22, 2010

Landscaping for energy savings, the focus of this document, is a subset of what is sometimes called *environmental landscaping* or *enviroscaping*. Landscaping for energy savings includes landscaping around residential homes, commercial structures, office buildings, and government-owned buildings. It also includes landscaping for such planted sites as road medians and parking lots. The purpose of landscaping for energy savings may be to modify the microclimate of a residence or, on a larger scale, of an urban region. It includes landscaping for both energy and water conservation. Water conservation is included as an energy saver because energy is needed to pump water from one location to another.

According to the [Energy Information Administration](#), almost a third of the residential electricity consumption in the U.S. is for heating, ventilation and air conditioning. In the Northwest, this may be considerably less since heating is commonly provided by gas, and air conditioning is not as widespread as in other regions of the country. No matter what the source of heat or abundance of water, landscaping decisions can affect energy use through the choice of plants, plant forms, and their placement in the environment. High ambient temperature, wind control, and water usage all affect energy consumption and this consumption can be modified to some extent through landscaping. Estimating energy savings from appropriate landscaping is difficult due to many climatic and environmental variables but research from California indicates that landscaping with trees yields a significant reduction in energy use ([McPherson and Simpson, 2001](#)).

Various landscaping techniques can be used to influence microclimates resulting in energy savings. Deciduous trees planted to shade buildings during the summer and to allow access to light and solar heat during the winter can significantly affect the ambient temperature inside a building. Hardscaping – rocks, fences and walls can be used in the service of landscaping for energy savings along with plants. The varied heights of a combination of shrubs, trees, and hardscape help to control wind speeds, which is especially important for affecting the wind chill temperature in winter climates. Grouping plants according to the subtle differences of the landscape, planting ones that need more water in a swale or rain garden, and planting drought and heat tolerant ones on a south facing slope, may result in less water use. Harsh environments, such as road medians and parking lots, require that the plants be adaptable to extreme conditions such as heat, intense sun, flooding, salt, and pollution.

Choosing the right plant for the right place is the most important aspect of landscaping for energy conservation. When considering plant choices, keep in mind the environment that they will be living in, with the goal of using few external inputs after they've been established. For normal environments, consider making use of some native plants or plants of similar environments. Be aware of how well the plants of an area interact and be cautious about planting non-natives that might become invasive or may be classified as a noxious weed. When landscaping more extreme urban environments such as parking strips, medians, traffic circles, and parking lots, carefully chosen plants adapted to similar harsh environments may be required. These may include plants that are adapted to surviving in air pollution, saline soil or water, compacted soils, high temperatures, and dry environments.

The annotated list that follows provides both general information on landscaping for energy savings, and information that is more focused on landscaping in the northwestern United States.

General Websites on Landscaping and Energy

Energy Efficiency and Renewable Energy Clearinghouse. (Updated 2010, March 23). *Energy savers: landscaping*.

This website gives a general overview of strategies that the homeowner might use to reduce energy use, including climate and microclimate considerations, the use of plants for shading and windbreaks, and minimizing water usage.

http://www.energysavers.gov/your_home/landscaping/index.cfm/mytopic=11910

Energy Efficiency and Renewable Energy Clearinghouse. (1995). *Landscaping for Energy Efficiency*.

This brochure gives more information on site planning for protecting a home from extreme heat, wind, and cold through landscaping.

<http://www1.eere.energy.gov/library/pdfs/16632.pdf>

Fichter, Jeremy. University of Washington. (No date). *Parking Lot Parks*.

This short article introduces the idea of creating parking lots which are both multi-use and aesthetically pleasing. In addition to landscaping, the article also suggests the use of semi-pervious surfaces

http://depts.washington.edu/open2100/pdf/2_OpenSpaceTypes/Open_Space_Types/parking_lot_parks.pdf

Freilinger, Jocelyn L. University of Washington. (No date). *Parking Strip Gardens*.

Another short article with color photos about Seattle residents gardening in parking strips either with landscaping plants or edible gardens.

http://depts.washington.edu/open2100/pdf/2_OpenSpaceTypes/Open_Space_Types/parking_strip_gardens.pdf

Georgia Center for Urban Agriculture. (Updated 2010, September 13). *Microclimate*.

This site recommends that site analysis followed by suitable use of fences and low buildings, as well as plant placement, be utilized for the modification of a microclimate.

<http://apps.caes.uga.edu/urbanag/Home&Garden/indexFS.cfm?storyid=2316>

Michigan State University Extension. [2001]. *Energy Facts: Landscaping for Energy Conservation - Benefits and Important Considerations*.

Another short brochure on the subject, this one succinctly lists the four main goals of landscaping for energy conservation: maximizing solar heat in winter, and shade in summer, and minimizing wind in winter and directing it towards the building in summer. It also talks about a number of considerations for plant selection and placement.

http://web1.msue.msu.edu/msue/iac/energy/conservation-landscape_benefits.pdf

Native Plant Society of Oregon. (No date). *Using native plants for gardening*.

The NPSO website provides guidelines for maximizing the ecological and practical benefits of native plant gardening through plant selection by Oregon ecoregions. Plant lists for the ecoregions are available from local chapters and the user is encouraged to contact the chapter for information. The website has links to organizations, botanical gardens and nurseries dealing with native plants as well as access to some of their publications.

<http://www.npsoregon.org/landscaping2.html>

Seattle Public Utilities. (2007 May). *Resource-efficient Natural Landscaping: Design - Build - Maintain*. This guide was written for those working in the landscape industry and for developers. It takes a moderate approach to encouraging the use of native plants, fewer pesticides and water wise landscaping in the Seattle area.

http://www.savingwater.org/docs/Landscaping_Guidelines.pdf

Plant lists

Great Plant Picks. Elisabeth Carey Miller Botanical Garden. (2010).

Great Plant Picks is an educational plant program made up of horticultural professionals in western Washington. They plant trials and based on the results, produce a yearly list of new, interesting plant varieties that are safe to plant in this environment but that are not necessarily native.

<http://www.greatplantpicks.org/>

King County, Washington. (2008). *Native Plant Guide*.

This website has native plant lists and sample landscape plans for western Washington.

<http://green.kingcounty.gov/gonative/>

McMahan, Linda R. (Reprinted 2008). *Gardening with Oregon Native Plants West of the Cascades (EC1577)*.

This link references a page of downloads for the 30-page booklet. The booklet, which contains extensive color photos, was published by Oregon State University Extension.

<http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/19399/ec1577complete.pdf?sequence=7>

Plant Native. (2002-2009).

The purpose of the Plant Native group is to encourage the use of native plants and naturesscaping in order to *promote biodiversity, preserve our natural heritage, reduce pollution and enhance livability* through landscaping. The website allows the user to select the state or region of the state for suitable species, and lists local nurseries and plant organizations.

<http://www.plantnative.org/>

Washington State Noxious Weed Control Board. (Updated 2010 October 5).

Washington State Noxious Weed Control Board website publishes information on weed laws, weed identification and plant lists.

<http://www.nwcb.wa.gov/index.htm>

Washington State Noxious Weed Control Board. (2007). *Garden Wise : Non-Invasive Plants for Your Garden, Eastern Washington Guide*.

This website has photos and descriptions of invasive plants in eastern Washington with three noninvasive alternatives for each.

http://www.nwcb.wa.gov/education/Eastern_Garden_Wise_Web.pdf

Washington State Noxious Weed Control Board. (2008). *Garden Wise: Non-Invasive Plants for Your Garden, Western Washington Guide*.

This website has photos and descriptions of invasive plants in western Washington with three noninvasive alternatives for each.

http://www.nwcb.wa.gov/education/Western_Garden_Wise_Web.pdf

Washington State University. Dept. of Horticulture and Landscape Architecture. (2010). *Hardy Plants for Waterwise Landscapes*.

Common and scientific names are listed for plants suitable for landscaping in eastern Washington and Idaho.

<http://www.wsu.edu/~lohr/wcl/index.html>

United States Department of the Interior. Bureau of Land Management. Idaho State Office. (2003). *Landscaping with Native Plants of the Intermountain Region*.

Plants native to the dry region of the Northwest are showcased with color photos and descriptions of use in garden landscaping.

http://www.idahonativeplants.org/guides/cover_p7.pdf

Water and Energy Related articles

Natural Resources Defense Council. (2009). *Water Saving Solutions: Stopping Pollution at its Source with Low Impact Development*.

Low Impact Development utilizes methods to keep run-off from going directly into large bodies of water such as lakes, rivers and seas. These methods include using permeable, rain barrels and swales to divert the water to places where it can filter through soils before flowing into the groundwater system.

<http://www.nrdc.org/water/lid/files/flid.pdf>

Landscaping for Harsh Environments

Portland Bureau of Environmental Services. (2010). *Portland Green Street Program*.

In 2007, Portland City Council enacted the Green Street Program with the objectives of managing stormwater and enhancing the livability of neighborhoods through landscaping. This is a citizen driven initiative with the help and backing of the city. The website is packed with information on what the citizens of Portland have done to create these areas.

<http://www.portlandonline.com/BES/index.cfm?c=44407>

University of Tennessee. Agricultural Extension Service. [1998]. *Trees for medians in Tennessee*.

This 2-page brochure talks about the conditions that trees in medians may have to survive in, lists the qualities that trees planted in medians should have, and gives a list of trees that fit these.

<http://www.utextension.utk.edu/publications/spfiles/SP516.pdf>

United States. Environmental Protection Agency. (2008). *Green Parking Lot Resource Guide*.

This extensive guidebook covers planning, stormwater management and landscaping among other topics. Five case studies are discussed including the Green Streets Program in Portland.

[http://www.streamteamok.net/Doc_link/Green%20Parking%20Lot%20Guide%20\(final\).PDF](http://www.streamteamok.net/Doc_link/Green%20Parking%20Lot%20Guide%20(final).PDF)

© 2010 Washington State University Extension Energy Program Library

This publication contains material written and produced for public distribution. You may reprint this written material, provided you do not use it to endorse a commercial product. Please reference by title and credit the Washington State University Extension Energy Program Library. Visit our website at <http://www.energy.wsu.edu/EnergyLibrary.aspx> WSUEEP10-044