

THE PLAN TO CONSERVE ENERGY

GOAL: Encourage Modes of Transportation, Patterns of Land Uses and Designs of Sites and other Actions that Conserve Energy.

The increasing costs of energy, concerns about air pollution and the desire to reduce American dependence on foreign fuel sources generates the need for energy conservation. Energy costs are also a major part of the municipalities' annual expenses, including to heat buildings, light streets and operate vehicles.

The municipal officials should conduct a study of ways to reduce energy consumption in each municipally-owned building. Improvements should be carried out that are shown to be cost-effective over the long run. Any new building should be designed to minimize its energy consumption, including making use of passive solar technology and making maximum use of natural light.

The municipalities should also evaluate current street lighting and other outdoor lighting to determine the possibilities of using more energy-efficient methods. New street lights should only be installed where there is a clear need. In some cases, reflective devices can be used to identify hazards to motorists at a much lower cost than operating and maintaining a street light.

The municipalities should also promote land use patterns that are energy-efficient. This includes encouraging opportunities for close-to-home shopping, employment and recreation. Bicycling and walking opportunities should be emphasized, as well as expanded public transit service to reduce dependence on individual motor vehicles.

Carpooling should be promoted, particularly through the provision of park and ride lots. There are currently no park and ride lots in the municipalities, however federal funding is available for PennDOT to develop new park and ride lots. The municipalities should look into working with other carpooling resources such as Commuter Services of Pennsylvania. The Borough of West Reading is currently a Community Partner with this organization to help provide commute option assistance to their organizations, interested parties and residents within the Borough.

The zoning ordinance should continue to provide opportunities for attached housing. Attached housing (such as townhouses) typically require substantially less energy for heat than single family detached houses, because they are less exposed on the sides to the elements. The municipalities' Construction Code and accompanying State regulations already establishes minimum insulation requirements for new homes. The zoning ordinance should also allow windmills and height modifications if needed for wind or solar energy devices. The municipalities' development regulations should also promote site layouts that allow homes to be clustered on the most appropriate portions of a tract based on existing landforms, slopes and orientation.

Public Awareness and Education

Municipal officials should work toward making residents, property owners, builders and developers more aware of the need for energy conservation in the region. The following techniques are examples of what can be used to educate the public about the need for and value of energy conservation:

- Continue to encourage the use of bicycles and walking.
- Provide information on energy conservation and water conservation methods, including through a municipal newsletter, municipal website and social media. This should emphasize simple and low-cost ways of conserving energy.



West Reading Borough Hall

Chapter 5 - The Plan to Conserve Energy

GOAL: Protection of natural resources and regional open space from utilities

The increase of natural gas use within the nation has put pressure on local municipalities which host existing pipeline systems. The municipalities within the Suburban Berks West planning region should have a consistent approach on addressing expanding pipeline utilities and how to protect and preserve the natural features of the region.

- Encourage lower-income residents to take advantage of Federal and State grant programs to weatherize their homes to reduce home heating costs.

What Can Developers and Builders Do?

Developers and builders should be encouraged by the municipal staff and officials during the review process to build better buildings through design and construction. Promoting the construction of LEED certified buildings in the municipalities should be encouraged. LEED is a green building rating system used throughout the world and stands for Leadership in Energy and Environmental Design. LEED certified buildings can have many positive benefits, including saving energy and costing less to operate. LEED projects are categorized based on how many points are earned across categories such as energy use and air quality. These rating levels are: Certified, Silver, Gold and Platinum.

Examples of LEED Buildings

- RPA Engineering Spring Ridge Building – Spring Township – Certified
- Kohl's – Spring Township – Silver Certification
- Holleran Residence – Spring Township – Gold Certification
- PSU Berks Classroom Lab Building – Spring Township – Gold Certification

Developers and builders should be encouraged by municipal staff and officials during the review process to use the following principles and objectives which utilize the natural elements such as the sun, wind, landforms and vegetation to support heating and cooling systems.

Considering Natural Elements to Conserve Energy

- In addition to capturing the sun's rays through solar panels to provide electricity, the sun should be considered when orienting and designing new buildings. By orienting a new building on an east-west axis within 20 degrees of south, solar access is maximized. This also minimizes overheating in the Summer months. When designing a new building, considerations should be taken when considering something as simple as the roof color. Using lighter colors or reflective materials can reduce cooling costs in the summer and should be considered to increase comfort for buildings or spaces that are not air conditioned, such as garages and covered or indoor patios. Another basic building design that should be encouraged is overhangs. When installing the proper length overhang, the sun's rays can be blocked from hitting a majority of the building and windows during the Summer, but allowed during the Winter.
- The wind can be used not only to generate electricity through the use of windmills and turbines to lower heating and cooling costs, but should also be considered when positioning new buildings. New homes and businesses may have outbuildings associated with them such as garages, sheds, barns and storage buildings that are not heated or cooled. These unheated buildings should be placed upwind from the home or heated building in the direction of the prevailing wind, which is primarily to the west and northwest in Pennsylvania. These buildings serve as a windbreak to protect the heated building from winter winds. This same concept can be used by itself or in combination with other natural elements such as landforms and vegetation to create windbreaks that effectively lower heating and cooling costs.
- Landforms such as large hills and mountains to the west and northwest of buildings can act as a windbreak as discussed above to lower heating and cooling costs. Even smaller sloping close to a building can

deflect winter winds when building on the southern and southeastern facing slopes. Buildings can also be constructed into hillsides providing natural insulation.

- Vegetation can be utilized in multiple ways to lower heating and cooling costs, which should be considered when landscaping around new and existing buildings. When creating a windbreak using vegetation, evergreen trees such as Colorado blue spruce, Douglas fir, Hemlock, and White pine are best for our area within Pennsylvania. Deciduous trees are best planted to the east and west of buildings to provide shade during the Summer, but still allow sunshine to hit and warm the building during the Winter when the branches are bare. The planting of shade trees should also be considered over air conditioning units, patios, driveways and roadways. Vegetation can also provide added insulation through the installation of a green roof. Green roofs are ideal on flat or shallow pit roofs to manage storm water or provide a rooftop open space, but the added benefit of reducing heating and cooling costs makes this vegetation something to be considered when constructing new buildings.

Planning for Solar Access and Shading

The term “solar access,” refers to the availability of sunlight during the period of the day and year when the sun’s energy can be most usefully employed by solar energy collection systems. Solar access consists of two basic principles:

- proper orientation to the sun, and
- freedom from shading by obstructions.

A general southern exposure is essential for solar systems to be effective, but the ideal orientation will vary according to the nature of the solar application and micro climatic conditions. An exposure within the range of 20 degrees east to 20 degrees west of south is generally acceptable for most solar applications.

This implies orienting streets in a general east-west direction. In areas already platted in a manner detrimental to solar utilization, building additions, infill developments and redevelopments should be permitted to be solar-oriented.

The term “solar skyspace,” refers to the space which must be free of obstructions to protect a given area from shading. Protection of the solar skyspace need not be absolute for solar energy systems to be effective. But land use controls should protect that portion of the solar skyspace necessary for the economical operation of solar energy systems without unreasonably burdening adjacent landowners.

