Introduction

This Chapter presents a discussion of a sustainable future and energy conservation in the Township. This is a new element to the Township’s Comprehensive Plan, as local sustainability and energy conservation planning has only become more prevalent in recent years. Sustainable practices involve a balance of economic, environmental, and lifestyle factors that can positively impact overall quality of life. As the Township and surrounding region continue to experience growth, it is important to understand and implement strategies for sustainable practices that continue to protect and enhance sensitive resources, employment and economic options, and healthy lifestyle opportunities for residents and businesses.

Chapter Organization:

Sustainable Future p. 13-1
What is ‘Sustainability’?
Elements of a Holistic Sustainability Program
Evaluating/Planning for Sustainability

Energy Conservation p. 13-10
Overview
Energy Usage and Emissions
Energy Generation Alternatives
Energy Conservation Considerations

Resource Standards Summary p. 13-19
Planning Implications p. 13-19
Recommendations p. 13-20

Sustainable Future

What is 'Sustainability'?

*Sustainability is a planning approach to address meeting the needs of the existing population while still taking into account and not compromising future generation's ability to meet their needs.*

Sustainability entails finding a workable balance between human use of natural resources and nature's ability to replenish its resources. A sustainable future relies on acknowledging the interdependence of human safety, health, and welfare with the environment, and implementing practices which foster conditions to allow continuing natural resources. Planning for a sustainable future is necessary to ensure there remains adequate water, biotic, and land resources for current and future generation’s survival, health, and prosperity.
Elements of a Holistic Sustainability Program

Sustainability is often portrayed as a ‘three-legged stool’ supported by natural environment, social community, and economy ‘legs’, which work together in balance. Energy conservation is inherent in each leg of sustainability. Like a stool, which must have legs for support, holistic community sustainability requires interaction and integration of natural (ecological), social (human) and economic (financial) systems. Together all three systems form the foundational elements for a community-wide sustainability program and need to be evaluated in relation to one another to develop effective community policies for a sustainable present and future. To help bring the environment, community, and economics into better balance, local planning for sustainability needs to address the interdependence of these three elements. The graphic below displays the interdependence and relationship of these three systems in more detail.

For balance between the three systems to be realized and maintained, ways to implement environmentally sound practices need to be considered alongside social and economic concerns. From a local planning perspective, the objective is to explore and recommend ‘green’ initiatives that are sustainable and doable by keeping in mind and weighing associated environmental, social, and economic benefits and costs.

At first glance, some sustainability measures may appear to not be related to any of the three legs of sustainability, e.g. why provision of workforce housing is related to protection of natural resources. Upon further analysis, however, one can see there are interrelationships, e.g. workforce housing, which tends to be compromised of smaller units built in compact development patterns within already developed areas, benefits the natural system by being less land consumption, disturbing fewer natural resources, and resulting in less vehicle CO2 emissions when built near shopping and employment. As this example shows, the key to evaluating sustainability is to examine all three systems together to establish a balance that optimizes (rather than maximizes) overall sustainability.

Natural Sustainability

The basis of Natural Sustainability entails sustainable land use policy, which focuses development to areas that are served by infrastructure (sewer, water, and multi-modal transportation) and that contain few environmentally sensitive features.

With population growth resulting in drastically and quickly changing landscapes, vital natural resources face greater risk for being overrun by development. Day-to-day normal human activities, e.g. commuting to work, can unintentionally result in long-term disruptions to needed ecosystems that support all life – e.g., invasive plants replace native species and insects that rely on native plants for their food source have less available food and their populations die off, thus, birds that feed on those insects have no food and leave an area to find food, and this imbalance continues up the food chain.
Significant impervious coverage, e.g. black top paving, and too little filtration of stormwater causes flooding, stream bank erosion, insufficient groundwater recharge, as well as groundwater pollution in well water. Divided up natural areas, e.g. meadows and woodlands, due to improperly designed and located development partition off plant and wildlife habitat causing species loss. Significant food waste in landfills releases airborne methane that diminishes soil nutrient replenishment. Over-dependence on fossil fuel, e.g. gasoline powered cars, and timber clear-cutting release an excess of carbon dioxide into the air. The goal of natural sustainability is to balance of human activity with the ability of natural resources to be replenished and able to continue to accommodate human activity. In order for this balance to occur and be maintained, types and extent of human activity will need to be evaluated and examined and will likely need to change.

Social Sustainability

The basis of Social Sustainability entails promoting a balanced population that is rooted and engaged locally in the community and that have access to needed facilities and services, e.g. recreation, schools, medical, shopping, social services, cultural activities, interaction and engagement, pedestrian access.

The Township is in a time of transition. With its tradition of agriculture, it had long been home to people with a range of incomes, backgrounds, and occupations and this mix of people with varying talents and abilities to contribute in the Township allows social sustainability. However, over the past several decades the Township witnessed a shift to increased housing developments, particularly those falling into higher price ranges. The high prices have made it challenging to maintain a population mix by making it increasingly difficult for a range of people including younger people, those who grew up in the Township and want to return to live as working adults, and the work force to live in the Township. Higher-priced housing (ownership and rental) market contributes to narrower population diversity overall making it difficult for trades people, police officers, teachers, and the like to work and live in the community. As of 2014, the Township has augmented housing stock with more affordable and diverse housing option, e.g. Penns Manor townhouse development c.2000 and Granite Ridge income-based apartments c.2013.

With its proximity to the employment opportunities in New Castle County and along the Route 1 corridor, the Township is in an attractive location to live. However, limited affordable housing options and other local planning-oriented considerations (e.g. time and money pressures, two-career households, longer work/school/shopping commutes, inherent isolation of larger lots, and limited pedestrian access) can hinder resident’s ability to become rooted/participate more in Township activities. The Township continuing to provide outreach, to the extent possible given staffing and resources, helps achieve social sustainability by encouraging and enabling community engagement, which can lead to a better informed and connected population and better quality (responsive and accessible) Township government via increased citizen participation.

Economic Sustainability

The basis of Economic Sustainability entails fostering a strong, diverse, local economy that offers everyday needed goods and services as well as employment opportunities close to home.

In the Township, local job opportunities have traditionally been agriculture-related in varying forms including mushroom production, horse farms, nurseries and tree farms, and dairy and crop farming. To be sustainable in the future, maintaining a balance between agricultural operations and newer residential, commercial, institutional, and industrial development is necessary in the Township.

An additional aspect of economic sustainability involves fostering home businesses/occupations, which are not only an increasing trend in the national economy but in addition provide the sustainable-oriented benefits of reducing the number of vehicles on the road overall and notably during peak ‘rush’ hours, expanding local business activities/opportunities, and generating additional local earned income tax revenue from employees with relatively minimal impact/increase in services. Retaining and promoting locally owned businesses in appropriate locations in the Township that serve residents and the greater region, as warranted, is the sustainable ‘formula’ to keep local dollars circulating in the local economy.
Evaluating/ Planning for Sustainability

Attaining a sustainable future entails using a ‘top-down’ and ‘bottom-up’ planning approach - local decision-makers need to create planning policies that foster a more sustainable community, and residents, businesses, and property owners need to provide input/ feedback to the Township and work together to become involved and take actions towards sustainability.

Look at the 'Big Picture'

When evaluating community sustainability, Township policies and local activities can be examined in relation to each element of sustainability. This can be achieved by looking at the basis of each element (described above) and considering and answering related fundamental questions, as follows. Note the fundamental questions below provide a sampling of some of the key items that should be examined but do not necessarily provide an exhaustive list, and the Township will need to determine if there are additional questions of concern that should be added to the below.

Natural Sustainability

➔ Will the policy or activity promote a self-sustaining ecosystem?
A self-sustaining ecosystem allows natural processes, e.g. forests replacing dead trees with saplings, to flourish without human intervention or assistance; e.g. self-sustaining ecosystems cannot occur in places where there is an unnaturally large deer population consuming the majority of saplings and young trees.

➔ Will the policy or activity encourage biodiversity?
Biodiversity refers to having a range of plant and animals that coexist, e.g. a forest hosting many types of trees and animals. In places where healthy biodiversity exists, continuing biodiversity is self-promulgating and important natural resources are more likely to survive and thrive, e.g. if disease strikes a particular species a forest having a variety of tree species can still survive.

➔ Will the policy or activity result in a healthy ecology that is non-degraded?
A healthy ecology provides plants clean water and nourishing soils, and provides animals appropriate and plentiful food sources (e.g. adequate, eatable, proper types of berries or insects). Pollution of air, water, or soil degrades the environment weakening or exterminating plants and animals.

Social Sustainability

➔ Will the policy or activity promote inclusion?
By striving to involve the various population groups, including seniors, disabled, and minority populations, a community can draw on a broad range of talents and capabilities when meeting the constant changes that are 21st century life.

➔ Will the policy or activity result in community connections?
A community in which residents, business owners, Township officials, institutions, and the like communicate can effectively deal with common problems. For example, a neighborhood watch can prevent crimes or active civic groups can help the Township in times of crisis.

➔ Will the policy of activity promote public health and a good quality-of-life?
Health and welfare of a community is a key function of government. There are a wide range of activities from proper land use planning, to pedestrian access, to providing recreation open spaces that are involved in planning or health and welfare.

Economic Sustainability

➔ Will the policy or activity generate long-term financial stability?
Innovation in the marketplace is driven by competition, and some business will eventually fail. Municipalities can establish policies that enable and facilitate new businesses and keep in mind the balance of short-term financial gains and long-term community needs and economic stability.

Will the policy or activity generate a diversity of employment opportunities?
Local economies that rely heavily on one economic driver can prosper, but only as long that the driver is viable. To help avoid a potential boom-and-bust cycle, municipalities can work to promote a diverse business base in the community.

Will the policy or activity support a diverse labor force?
Various segments of the labor force have varying skill sets. In order for diverse businesses to thrive in and/or move to a municipality, they need access to workers with varying skill sets and levels of experience. Municipalities can work to promote a diverse labor force that is attracted to and living in the community.

Examine Specific Planning Topics

While there is no single standardized approach for evaluating sustainability at the local planning level, a common thread is the analysis of key topics that are current or predicted future issues or areas of local concern. This approach has been used and effective in a number of communities (e.g. City of El Paso, TX, Cranberry Twp, NJ, West Vincent Twp, PA, Strathcona Co, Alberta Canada). While this is not an exhaustive list of topics and Kennett Township needs to develop their own list of topics tailored to areas of concern and needs in the Township, five of the most commonly addressed local planning topics include:

**Land Use, Sensitive Resources, Facilities and Infrastructure** – addresses subtopics including: the manner by which (how) and the use for which (why) land is developed; patterns of development and their relation to types of lifestyles and quality of life factors; related infrastructure needs; maintaining and fostering useful and flourishing farmlands; protected lands and/or those maintained for wildlife habitat.

**Water** – addresses subtopics including: safe and adequate public drinking water; protecting aquatic wildlife habitats; addressing safe and adequate waste water disposal, treatment, and discharge; storm water run-off locations, impacts, and appropriate and cost-effective remediation; maintaining and enhancing surface and ground water quality and quantity.

**Air Emissions** – addresses subtopics including: reduction of air pollution and carbon emission; stabilizing and restoring appropriate ambient air temperatures in relation to the climate zone.

**Energy** – addresses subtopics including: energy consumptive transportation systems and modes of travel; areas and uses in a
community that are most and least energy efficient or consumptive; renewable energy types, requirements, issues; alternative energy sources and possibilities; and energy conservation.

**Goods and Materials** – address subtopics including: solid household and business waste disposal; hazardous waste disposal; waste reduction; increasing recycling and reuse and its profitability; extraction, harvesting, use, and transport of natural resources, e.g. natural gas, quarrying, minerals, timber.

Many local planning issues relate to more than one planning topic. For example, circulation/ mode of travel are a land use concern (as transportation infrastructure is a significant component of the built environment) and have an impact on energy consumption and air emissions (as per person public transit options use less energy/ generate fewer emissions than single occupancy vehicles).

Table 13-1 provides a sampling of topics the Township could evaluate, showing topics that commonly arise as local planning concerns. The table also includes tools that could be used to assist in addressing the planning topics. These tools are discussed in more detail at Chester County’s Discover the Future educational and outreach website, http://www.chescopagreen.org/Tools/AllTools.cfm. The website includes 59 sustainability-related planning tools that municipalities, as well as residents and businesses, can use to plan for and implement sustainability initiatives.

As an implementation step to the Comprehensive Plan, the Township could assemble a sustainability advisory committee to spearhead undertaking a Township-wide sustainability analysis plus other recommended planning actions in the Chapter. As a first step towards this more detailed analysis, some initial areas of concern raised during the Comprehensive Plan update process include:

- **Water Quantity and Quality/Stormwater** – Stormwater management in the Township includes drainage basins, which are effective in removing some run-off. Stormwater management needs to be improved in areas where notable storm-surge related flooding occurs. Properly designed and maintained basins can improve groundwater recharge and reduce stormwater flows, and the pollutants they carry, directly into surface waters. However, basin maintenance has been a concern in the Township. Chapters 4 and 10 provide additional information.

- **Water Quality/Landscaping** – Pesticides, herbicides, and fertilizers in landscaping and lawns is a concern in the Township and reducing their use decreases the level of non-point source pollution that enters local surface waters. Integrated Pest Management to manage insects, weeds, and species diseases uses methods that have less impact on human and environmental health.

- **Water Quality/Snow Plowing** – The application of salt for snow/ice removal is a concern for water quality as the salt during snow melt runs off into surface waters. There are environmentally-safer options for de-icing roads other than traditional salting.

### Table 13-1: Sampling of Sustainability-related Planning Topics and Tools, (con’t)

<table>
<thead>
<tr>
<th>TOPIC</th>
<th>SUBTOPIC</th>
<th>SUSTAINABILITY TOOLS</th>
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<tbody>
<tr>
<td><strong>FACILITIES AND INFRASTRUCTURE</strong></td>
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<td>Parks and Recreation</td>
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<td>Community Gardens</td>
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<td></td>
<td>Parkland Dedication/ Fee-In-Lieu Standards</td>
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<tr>
<td>Circulation</td>
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<td>Parking Facilities</td>
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<td></td>
<td></td>
<td>Bicycle/ Pedestrian Facilities</td>
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<td></td>
<td></td>
<td>Roadway Connectivity</td>
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<tr>
<td><strong>WATER</strong></td>
<td>Water Quality, Quantity, and Conservation</td>
<td>Improving Water Quality - Total Maximum Daily Loads (TMDL) Implementation</td>
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<tr>
<td></td>
<td></td>
<td>National Pollutant Discharge Elimination System (NPDES)</td>
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<td></td>
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<td>Riparian Buffers</td>
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<td></td>
<td></td>
<td>Water Conservation Designs and Practices</td>
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<td></td>
<td>Storm Water and Flooding</td>
<td>Stormwater Management Best Management Practices (BMPs)</td>
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<td></td>
<td></td>
<td>Stormwater Facilities Operation/ Maintenance/ Retrofitting</td>
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<tr>
<td><strong>AIR EMISSIONS</strong></td>
<td>Air Quality</td>
<td>Street Trees</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bicycle/ Pedestrian Policy</td>
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<tr>
<td></td>
<td></td>
<td>Transit Stops</td>
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<tr>
<td><strong>ENERGY</strong></td>
<td>Energy Audits</td>
<td>Municipal Energy Audits</td>
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<tr>
<td></td>
<td>Energy Generation</td>
<td>Power Grid Sufficiency</td>
</tr>
<tr>
<td><strong>GOODS AND MATERIALS</strong></td>
<td>Hazardous Waste</td>
<td>Household Hazardous Waste Programs</td>
</tr>
<tr>
<td></td>
<td>Municipal Waste</td>
<td>Managing Solid Waste</td>
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<tr>
<td></td>
<td>Reuse and Recycling</td>
<td>Reuse/ ‘Free-cycling’ of Items</td>
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<tr>
<td></td>
<td></td>
<td>Single-Stream Recycling/Drop Off Centers</td>
</tr>
</tbody>
</table>

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**Discover the future**

Creating a sustainable future for Chester County,

[Chester County website]
### Example Planning Topics

<table>
<thead>
<tr>
<th><strong>Natural Sustainability:</strong></th>
<th><strong>Social Sustainability:</strong></th>
<th><strong>Economic Sustainability:</strong></th>
</tr>
</thead>
</table>

**Topic: Land Use**

**Subtopic: Land Consumption/Compact and Mixed Use Development**

Efficient use of land is a basic way to conserve natural resources, e.g., compact development uses land efficiently by concentrating uses; open space development clusters uses on a portion of a tract which allows sensitive features to be retained as open space on the remainder of the tract; and redevelopment allows an existing developed site to be reused or enhanced to contain new uses that would otherwise be built on undeveloped land.

Sparing ‘green field’ lands from being developed allows a non-degraded ecological system. Linking retained green fields as a network sustains populations of wildlife species that require safe routes of travel and ample space to survive and thrive.

Compact development, particularly that has an appropriate mix of uses, serves as a public health benefit. It is more walk-able (vs spread-out uses), enabling residents to access shopping and services by foot or bike and get exercise at the same time. Physical activity inherent in walking, bicycling, and the like has positive health benefits, e.g., improved cardiovascular health and physical/mental wellness.

It also allows for social interaction due to the inherent closeness and mixing of uses and allows those without personal motor vehicles to feel more included in the community. It gives a stronger sense of community since it is built on a human scale, including homes close to the sidewalk and front porches both of which facilitate neighbor interaction.

Compact design and a mix of uses serves employment centers, e.g., office or industrial parks. Providing convenience uses (e.g., banks, dry cleaners, restaurants, daycare) reduces vehicle miles traveled and employees leaving the Township for these services, thus fostering the local economy.

Diverse businesses locating in already developed and mixed use areas that attract a diverse skilled labor force is of benefit to both workers looking for jobs and employers looking for available skilled labor and for reciprocal close-by business services.

Less road, sewer, water, power transmission, and other infrastructure to build, repair, maintain, and upgrade is of financial benefit for municipalities and taxpayers. Paying off loans or bonds obtained for infrastructure allows opportunity for long-term financial stability sooner.

**Topic: Sensitive Resources**

**Subtopic: Land Management/Floodplains**

When well-managed, properly vegetated floodplains are largely self-sustaining. They support diverse plant and animal life in upstream locations. They are nature’s ‘detention basins’ for stream overflow waters during flood events. They serve as collectors of pollutants as downstream land features.

Well-managed, vegetated floodplains slow and absorb flood overflows waters and thus reduce the impacts of flooding. They inherently add protection for communities, businesses, and individuals that may lack adequate insurance coverage.

They can serve as naturalistic open spaces/place for passive recreation, e.g., primitive hiking trails, that booster public health/quality-of-life.

Well-managed, vegetated floodplains inherently reduce flooding in a community in perpetuity and its economic impacts. They are nature’s ‘insurance coverage’ against total flood destruction, e.g., old milling areas are along streams and often in the floodplain so controlling flood events by properly maintaining flood-prone areas makes such areas more economically stable and viable.

**Topic: Facilities/Infrastructure**

**Subtopic: Circulation/Sidewalks**

Sidewalks provide recreation and exercise opportunities in the existing built environment, thus providing an alternate to recreation in naturalized passive parks and open spaces where sensitive habitat/ resources can be degraded or destroyed by human overuse.

Use of sidewalks helps reduce carbon emission, improve air quality, and reduce energy consumption, traffic congestion, and overuse/ frequency of road repairs/ upgrades.

Sidewalks allow mobility and access for residents without vehicles, promote social face-to-face contact and interaction between people, and provide inherent public health promoting exercise opportunities close to home.

In the proper locations, sidewalks can inherently increase property values in perpetuity, and allow/ open up access to work, school, parks, shopping, and other places using an alternate mode of travel other than vehicles.

Sidewalks also allow people to reduce spending/ save money by not needing to encumber the expense of buying/ maintaining a personal vehicle, and allow reduced municipal and business expense in providing and maintaining as many parking areas and roadways.
### Table 13-2: Example of Evaluating Sustainability

<table>
<thead>
<tr>
<th>EXAMPLE PLANNING TOPICS</th>
<th>NATURAL SUSTAINABILITY:</th>
<th>SOCIAL SUSTAINABILITY:</th>
<th>ECONOMIC SUSTAINABILITY:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>TOPIC: WATER</th>
<th>SUBTOPIC: Water Quality &amp; Quantity</th>
<th>Example of Evaluating Sustainability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drip irrigation of treated effluent promotes groundwater recharge which is a major contributor to having a self-sustaining ecosystem, and treated effluent does not degrade the environment.</td>
<td>Properly designed and managed drip fields can be used as open space and include passive use trails, thus contributing to public health and quality of life.</td>
<td>Well-designed and maintained drip fields can function for the long-term, thus providing reduced overall lifetime costs.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOPIC: AIR EMISSIONS</th>
<th>SUBTOPIC: Air Quality</th>
<th>Example of Evaluating Sustainability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street trees improve air quality and moderate ambient temperature.</td>
<td>Shade provided by street trees yield more comfortable, and thus greater, opportunity for summer outdoor recreation, exercise, and community interaction activities, factors that all contribute to public health and quality of life.</td>
<td>Street trees provide visual enhancement increases property values on a long term basis. They help reduce cooling costs/ use in summer by providing shade and reduce heating costs/use in winter by buffering winds, which provides less energy consumption and greater energy conservation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOPIC: ENERGY</th>
<th>SUBTOPIC: Energy Generation</th>
<th>Example of Evaluating Sustainability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of solar powered electricity generates fewer waste materials and no air pollution as compared with conventional fossil fuel energy generation.</td>
<td>Reduced air emission associated with solar energy contributes to overall public health. Visual impacts and glare on nearby properties are considerations in solar design, but constantly improving technology/design, e.g. ‘blackened’ solar roof panels, solar shingles, is making this an area of less concern.</td>
<td>Solar power provides a long-term stable energy source which in turn promotes economic/market stability. An increase in use of solar results in additional job opportunities and a boost to the employment section. However, the initial significant cost of installation makes solar a limited option for most individuals.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOPIC: GOODS AND MATERIALS</th>
<th>SUBTOPIC: Reuse/ ‘Free-cycling’</th>
<th>Example of Evaluating Sustainability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reusing already produced goods and materials generates less waste and needed space for additional landfills and generates fewer emissions related to producing new materials and their transport to market.</td>
<td>Reusing items provides access to a wider variety of goods and maintains use of historic items from the past, thus promoting increased quality of life and cultural connections. It also can promote community connections and inclusion via local persons providing, trading, selling, or donating items to other community members.</td>
<td>Reusing items provides an often more affordable way for persons to have access to higher quality or originally more expensive items. It provides salvage and repurposing of items small and local business start-up opportunities.</td>
</tr>
</tbody>
</table>

### Develop Sustainability Planning Indicators/ Checklist

A Sustainability Checklist provides a listing of indicators by planning topic. Indicators measure progress towards implementing natural, social, and economic sustainability through policies and actions, and demonstrate linkages and the impact of actions across environmental, social, and economic parameters. Table 13-3 provides a sample of this type of checklist for illustrative purposes only.

### Create Specific Sustainability Planning Actions

Just as in Chapter 2 where there are specific actions that implement Plan goals, the Township will need to develop specific planning actions to implement its sustainability planning program. The end of this Chapter
includes general sustainability-related recommendations to guide the Township in developing a full sustainability plan, which would lead a Township sustainability program. Example actions could include:

**Example Sustainable Land Use Actions**
- Allow accessory dwelling units in zoning to help accommodate aging in place of residents.
- Provide information about ‘green’ building and remodeling practices on the Township website.
- Plants community gardens on roadways as was done at the entry to the Route 1 bypass.
- Support ‘Green’ House tours in the region.

**Example Sustainable Transportation Actions**
- Lower minimum parking requirements for new commercial development or set maximum parking requirements.
- Make bicycle access and facility planning a routine part of Township transportation planning when changes to intersections, traffic signal operations, or travel lane widths are proposed.
- Take into account Township-wide walkability and bikeability to improve access for existing neighborhoods to for work, school, and recreation trips as well to as transportation nodes.

**Example Sustainable Resources Actions**
- Publish a regular ‘column’ in the Township newsletter about sustainability issues and topics, e.g. benefit and cost effectiveness of landscaping with native and non-invasive plants, rain water collection, or sustainable lawn maintenance practices.
- Encourage that ‘green’ roofs be considered in new development and construction or major renovations, and provide information about green and high reflectant roofs on buildings as well as other reflectance and shading techniques for parking lots and impervious surfaces.
- Offer incentives to foster alternative energy generation in the Township.
- Work with TLCSCC to develop and install appropriate interpretative signs and information about biodiversity on Township lands.

**Example Sustainable Good and Materials Actions**
- Provide links to information, resources, and tools for residents and businesses on green building practices, energy conservation, and other sustainability measures on the Township website.
- Acknowledge ‘green’ measures undertaken by residents, businesses, and the Township via a certificate, posting in the Township building lobby, and an announcement on the Township website.
- Offer a financial incentive to share the cost of energy audits with homeowners and provide information about any rebates available through PECO, Energy Star, or others for such.
- Promote LEED or Energy Star Certification for new construction and redevelopment building projects.
- Provide mini-grants to promote recycling awareness, e.g. small grants ($500-1500) can encourage schools, community groups, and other non-profits to develop innovative projects that promote source reduction, reuse, or recycling in the Township.
- Require Township properties use sustainable landscaping and Integrated Pest Management practices.
Energy Conservation

Overview

Energy conservation has been a topic of discussion for decades, but has only recently become a focus of local planning. The increased interest is largely the result of rising energy costs, better understanding of the consequences of global warming and climate change, and concerns about compromising national security with over dependency on imported fuels. Energy conservation and efficiency is a major tool to reduce greenhouse gases, which the global scientific community has identified as having the greatest impact on climate change.

In response to such concerns, PA Act 247, the Municipalities Planning Code (PA MPC) encourages municipalities to address energy conservation and the effective utilization of renewable energy sources. PA MPC §301.1 sets forth that a comprehensive plan can include a plan element that examines present and future use of energy, while Section 503 allows the SLDO to include provisions for the use of renewable energy systems and energy conserving building design and Section 604 requires zoning facilitate access to incident solar energy. Local and regional planning is important in implementation of renewable and low carbon energy/infrastructure and in locations and ways that are appropriate and workable.

Like the topic of sustainability, energy conservation is a broad topic that affects, directly or indirectly, most aspects of local planning. To help guide local planning efforts, Landscapes2 identified five key areas that should be considered when assessing energy use:

- **Reducing Demand and Consumption** as to the amount of energy used.
- **Improving Energy Efficiency** to use energy more efficiently.
- **Redevelopment, Reuse, and Recycling** to reduce energy consumption by reusing materials, adaptively reusing buildings, and redeveloping previously developed lands.
- **Alternative and Sustainable Energy** can generate power from renewable sources.
- **Removing Unintentional Barriers to Energy Conservation** by analyzing policies and provisions meant to improve living conditions, but that unintentionally result in higher energy costs for residents, e.g. homeowner association rules that forbid outdoor drying of laundry.

Energy conservation relates to all forms of energy use and generation by individuals, businesses, institutions, and government. Energy conservation and efficiency strategies range from the simplistic of actions (e.g. people turning out lights upon leaving a room), to more involved actions (e.g. property owners installing solar power), to complex policy-oriented actions (e.g. requiring utilities have at least 75 percent of electric generation from renewable sources). While municipalities generally have little control over the level and type of energy consumption of others, they do have control over energy use and efficiency for municipal facilities, services, and operations. Land use patterns – including the manner in which land is used and how uses relate to one another – is another important influence on energy usage and one that municipalities have some control over. Municipalities can influence energy activities of others through regulation and incentives as well as through policy, outreach, promotion, actions, and education. The Plan section looks at how energy conservation can be practiced in the Township for achieving such energy conservation measures as working to help reduce carbon dioxide emissions, address auto-only dependent lifestyles, improve efficient use of energy in municipal government, homes, and businesses, and facilitate land development and building construction in a more sustainable, energy efficient manner.

Energy Usage and Emissions

Energy usage refers to the amount of power consumed for applications to function (e.g. motor vehicles, factories, stores, and houses). It is analyzed by ‘end-use sector’ (those broadly categorized entities of
residences, businesses, industry, and transportation) at the point of consumption (vs points of generation and transmission). Energy use information for southeastern PA is available from the U.S. Census and DVRPC’s Energy Use and Greenhouse Gas Emissions Inventory that provides energy-use estimates. State and national level data is available through U.S. Department of Energy (US DOE). Data shown in this section is meant as a starting point for Township planning discussions and general policy making. More detailed data collection and analysis could be performed as part of Township-wide sustainability planning.

Figure 13-1 shows combined per-capita energy usage for residents and workers for each municipality in the DVRPC region. Kennett Township falls in the higher end for energy used by residents and businesses, as does Chester County overall as compared to other counties in the DVRPC region. Information in Tables 13-4 through 13-8 also comes from DRVPc’s Inventory.

### Energy Usage and Emissions in the Township

DVRPC estimates that in 2010 energy consumers in Kennett Township used 1,347 billion BTUs (BBTUs) of energy at a cost of about $32,800,000 and yielding about 122,900 metric tons (94 percent) of total Township CO2 equivalent (MTCO2e) greenhouse gas emissions. The mobile-highway sector by far consumed the most energy (40 percent of total energy use in the Township) and also produced the most emissions of any sector.

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1 Transportation end-use section includes on-road transportation, passenger and freight rail, aviation, marine transportation, and off-road vehicles.
2 Non-Energy Sources of greenhouse gas emissions include those resulting from waste management (solid waste and wastewater), agricultural processes (animal and plant related), industrial processes, fugitive and process emissions from fuel systems (natural gas systems and petroleum systems), land use, land use changes, and forestry.
Residential

Township residents used electricity for their energy source more than any other type of energy source based on BBTUs used. Electricity use doubled that of natural gas or fuel oil, the second and third most used energy types. Electricity use for energy also yielded by far the highest energy expenditures and largest source of greenhouse gas emissions by the Township residential sector.

| Table 13-5: Residential Energy Use and Emissions in Kennett Township, 2010 |
|----------------------------------|----------------------------------|-----------------|--------------|-----------------|--------------|
| **ENERGY SOURCE** | **ENERGY USE (BBTU)** | **PERCENT** | **EXPENDITURES ($)** | **PERCENT** | **EMISSIONS (MTCO2e)** | **PERCENT** |
| ELECTRICITY | 162 | 45% | $6,028,915 | 61% | 21,780 | 63% |
| NATURAL GAS | 82 | 23% | $1,025,865 | 10% | 4,382 | 13% |
| FUEL OIL | 80 | 22% | $1,529,909 | 15% | 5,937 | 17% |
| LPG | 36 | 10% | $1,329,539 | 13% | 2,249 | 7% |
| OTHER FUELS | 0 | <1% | N/A | N/A | 0 | <1% |
| TOTAL | 361 | 100% | $9,914,228 | 100% | 34,348 | 100% |

Commercial and Industrial

Commercial and industrial businesses in the Township used electricity for their energy source more than any other type of energy source based on BBTUs used; double that of the second highest used energy source of natural gas. Electricity use also yielded the highest energy expenditures of any energy source and largest source of greenhouse gas emissions by the Township commercial and industrial sectors.

| Table 13-6: Commercial and Industrial Energy Use and Emissions in Kennett Township, 2010 |
|----------------------------------|----------------------------------|-----------------|--------------|-----------------|--------------|
| **ENERGY SOURCE** | **ENERGY USE (BBTU)** | **PERCENT** | **EXPENDITURES ($)** | **PERCENT** | **EMISSIONS (MTCO2e)** | **PERCENT** |
| ELECTRICITY | 273 | 61% | $7,238,338 | 56% | 36,686 | 79% |
| NATURAL GAS | 133 | 30% | $4,700,284 | 36% | 7,087 | 15% |
| FUEL OIL | 26 | 6% | $421,268 | 3% | 1,882 | 4% |
| LPG | 14 | 3% | $582,736 | 5% | 986 | 2% |
| OTHER FUELS | 1 | <1% | N/A | 0% | 60 | <1% |
| TOTAL | 447 | 100% | $12,942,625 | 100% | 46,701 | 100% |

Transportation

Transportation via private passenger vehicles, commercial vehicles, and public transit vehicles greatly contributed to energy usage and emissions in the Township. Not surprisingly, the most used fuel for motor vehicles was gasoline (73 percent). Vehicle trips starting or ending1 in the Township used 3,160,000 gallons of gasoline, containing 393 BBTUs of energy and costing about $9,950,000.

| Table 13-7: Transportation Energy Use in Kennett Township, 2010 |
|----------------------------------|----------------------------------|-----------------|--------------|-----------------|--------------|
| **FUEL TYPE** | **ENERGY USE (BBTU)** | **PERCENT** | **EXPENDITURES ($)** | **PERCENT** |
| GASOLINE | 393 | 73% | $7,312,122 | 74% |
| DIESEL | 147 | 27% | $2,634,365 | 26% |
| ELECTRICITY | 0 | <1% | N/A | 0% |
| TOTAL | 540 | 100% | $9,946,487 | 100% |

Non-Energy Emissions

In 2010, industrial processes made up the largest portion by far of non-energy sourced emissions (39 percent) in the Township. This was also the case in 2005, but with waste management as a close second.

| Table 13-8: Non-Energy Sources of Emissions in Kennett Township |
|----------------------------------|----------------------------------|-----------------|--------------|-----------------|--------------|
| **NON-ENERGY SOURCE** | **AGRICULTURE** | **FUGITIVE EMISSIONS** | **WASTE MANAGEMENT** | **WASTEWATER MANAGEMENT** | **INDUSTRIAL PROCESSES** | **LAND USE RELATED** | **TOTAL** |
| 2010: | | | | | | | |
| EMISSIONS (MTCO2e)** | 1,265 | 18% | 649 | 9% | 1,151 | 16% | 736 | 10% | 2,808 | 39% | 595 | 8% | 7,204 | 100% |
| 2005: | | | | | | | |
| EMISSIONS (MTCO2e) | 1,419 | 18% | 367 | 5% | 2,341 | 31% | 908 | 12% | 2,575 | 34% | (544) | (0%) | 7,066 | 100% |

*Land Use, Land Use Change, and Forestry ** MTCO2e – metric ton of carbon dioxide emission

1 Half of each trip was allocated to the Township, while the remainder of the trip was allocated to the municipality at the other end of the trip.
DVRPC Region Emissions

In 2010, emissions in the DVRPC region made up about 1.2 percent of total emissions in the U.S. With about 1.8 percent of the total U.S. population living in the DVRPC region, aggregate DVRPC regional emissions were around 30 percent lower than the U.S. as a whole. Municipalities having higher densities in the DVRPC region tended to give off less greenhouse gas emissions per capita. From 2005 to 2010, region-wide total emissions lowered by an estimated 8.1 metric ton CO2 equivalent. This reduction may have resulted from factors such as a slowed economy, a reduction in the percentage of electricity produced from coal vs. cleaner fuels, and an increase in motor vehicle fuel efficiency.

State-wide Energy Use and Emissions

PA is a leading East Coast supplier of coal, natural gas, nuclear power, and refined petroleum products to industries across the state and nation. PA ranks among the top 10 states in consuming coal, natural gas, petroleum products, and electricity; while, its total energy consumption per capita is in the lower half of states.

Table 13-9 shows state-wide energy use using various indicators. In terms of end-use sectors, the industrial sector leads energy consumption in PA. Of renewable energy sources, biomass is by far the most used energy source, and specifically use of wood for home heating has increased particularly in the northeastern U.S. since 2005.

Energy Generation Alternatives

US DOE indicates that installed global renewable electric power capacity doubled in size from 2000 to 2012, and is a growing portion of energy supply. As of 2012 in the U.S. alone, renewable electric represented 12 percent of total electric generation, with wind and solar being two of the fastest growing types. Renewable electric also is providing a growing proportion of new and additions in capacity in the U.S., e.g. 56 percent in 2012 up from 2 percent in 2004. The U.S. has been the world’s leading ethanol producer since 2006, and its use in gasoline blends has tripled since around that time. However traditional energy generators (coal, natural gas, nuclear, and petroleum) as of 2012 are still the most widely used sources for energy. This is largely due to associated installation and material costs, rapidly changing technologies, and locational issues, of alternative energy sources, e.g. wind, solar, and geothermal. With alternative energy gaining in use, economy of scale, and importance and energy generation technologies continually evolving, the Township will need to be prepared to respond to emerging forms of systems.
Wind Power

Chester County is not well suited for wind production, as shown in Figure 9-2. As wind power systems harness the natural power of wind, its use largely applies in areas that are free of obstructions and are well exposed to the wind, e.g. as open fields and hilltops. Areas designated Class 3 and 4 are suitable for most wind turbine applications, while Class 2 areas (which include Kennett Township) are marginal. Class 1 areas are generally not suitable.

Given the marginal wind power available in the Township, wind power generation would likely occur at the individual property level where energy generated can be significant and applied for the needs of the property. In terms of environmental effects, wind power produces no carbon emissions and wildlife impacts (primarily on birds) are continuously under study with the primary focus and issues of impacts being on large scale wind farms. Modern small wind turbines for individual property use can be compact, quiet, and efficient, and are produced in varying styles and sizes. Installation costs can be significant; however, maintenance costs are limited. Regulatory considerations include height, setbacks, noise, installation, design, and abandonment.

Solar Power

As Figure 9-3 shows, southeastern PA lies in the mid-range for exposure to sunlight. In comparison, Germany has a lower photovoltaic rating, but is a leader in solar energy generation. As solar energy systems harness the natural power of sunlight to produce energy, its use largely applies in areas with direct sunlight and southern exposure siting.

Solar thermal systems (flat-pane collectors or glass tubes) and photovoltaic (PV) systems (PV cells as panels, films, and roof shingles) can be installed as roof-mounted, pole-mounted, or ground-mounted. Given its PV rating combined with increasing nationwide energy prices, environmental awareness, and financial incentives to offset installation costs, Chester County has seen increasing small scale individual property level solar systems, where energy generated can meet the needs of the property plus provide the benefit of net metering. In contrast, solar farms or utility scale solar applications are much larger scale operations. While the technology for individual system vs solar farms is similar, the intent of the latter is generally the resale of energy to a utility company for commercial gain. Nonetheless, all solar systems benefit from energy production during peak demand hours. In terms of impacts, solar power produces no carbon emissions, however siting, glare, impervious coverage/stormwater, and abandonment are considerations. Installation costs can be significant, and systems require regular maintenance. Regulatory considerations include solar rights, design, setbacks, glare, height, and facility size (individual property vs solar farms/utility scale solar applications).
Geothermal

Based on US DOE information, much of the upper 10-feet of the Earth’s surface maintains a nearly constant temperature of 50-to-60°F.

A geothermal heat pump (GHP) system is made up of underground pipes, a heat exchanger, and ductwork into a building that takes advantage of that constant temperature for energy generation. In winter, heat from the relatively warmer ground goes through the heat exchanger into the building. In summer, hot air from the building is pulled through the heat exchanger into the relatively cooler ground. Heat removed during the summer can be used as no-cost energy to heat water.

Based on the U.S. Environmental Protection Agency (US EPA), GHPs can reduce energy consumption and corresponding air emissions up to 44 percent compared to air-source heating pumps and up to 72 percent compared to electric resistance heating in standard air-conditioning. GHPs are utilized in Chester County to an increasing extent with many larger-scale uses, e.g. West Chester University, having started to use these systems. GHPs are also suitable for single-family residences, but at this stage are still cost-prohibitive for installation for most homeowners.

Energy Conservation Considerations

Balanced Energy Conservation Strategy

With Kennett Township being a lower density developed community without significant existing infrastructure, consideration and analysis will be needed to determine opportunities to pursue energy conservation initiatives. On a positive side in the Township, much of the building stock is ‘newer’ relatively speaking as compared to a borough, and so will likely have been constructed with energy conserving features. Likewise, certain infrastructure, e.g. sewer and water lines, are newer and built using more recent technology and efficiency. Due to the more rural nature of the Township, the strategy for pursuing energy conservation may be to employ a balance to optimize energy conservation rather than maximize it. Being in KARPC, the Township can also take advantage of pursuing opportunities related to cost-saving cooperative energy conservation measures, e.g. regional cooperation for larger-scale efforts of recycling.

Centralized to Distributed Energy Generation

In the coming years the United States - and therefore impacting the Township – is expected to experience at least a partial transition from centralized to distributed/decentralized energy generation.

Centralized energy generation is currently the norm and is characterized by large electric generating plants that are usually located at a distance from where the energy is consumed. The electricity is then transported through the transmission and distribution infrastructure to the energy consumer.

Distributed energy generation refers to an energy network where there are multiple large and small-scale energy generators, which could include wind turbines, solar panels, and conventional fossil fuels or nuclear power plants. The graphic depicts differences between the systems.
Existing and New Buildings

Increased energy efficiency in buildings can be realized through considering site selection and design, new building construction and existing building improvement, and efficiency of appliances and heating, ventilation, and air conditioning (HVAC) systems.

Site Selection and Design Considerations are the initial steps in new building construction and building additions. As Figure 9-5 indicates, the natural cooling power of winds (wind tunnels and wind breaks), heating and ‘daylighting’ of sunlight, and vegetation for shade are primary considerations in siting a structure for optimal energy efficiency. Protecting natural, historic, and scenic resources is also an important factor to take into account. More information can be found at www.sustainablesites.org, www.chescopagreen.org, and www.montcopa.org/index.

LEED for Neighborhood Development (LEED-ND), an offshoot of LEED (see below), focuses on how well a development’s location and design integrate the principles of smart growth and ‘green’ buildings. Its rating system focuses on site selection, design, and construction elements that bring buildings and infrastructure together into a neighborhood and relate the neighborhood to its landscape, local surroundings, and regional context. LEED-ND can serve as a guide in creating standards and incentives for residential site selection and neighborhood development.
Efficiency ratings of buildings, appliances, and HVAC systems provide benchmark standards by which items are assessed for their energy efficiency.

Energy Star, created in 1992, is now an international standard for energy efficient consumer products such as computer products, kitchen appliances, buildings, and other products. Overall, qualified Energy Star products are to reduce energy costs by at least 30 percent. From 1993 to 2012, the cumulative effect of use of energy star in residential, commercial, and industrial sectors resulted in more than $239 billion in saving on energy bills and a reduction of more than 1.9 billion metric tons of greenhouse gas emissions.


Whole Building Design Guide, a program of National Institute of Buildings Sciences can be referenced as a guide to creating high performing buildings. (www.wholebuildingdesignguide.org)

Operations and Maintenance of existing structures can be bolstered to create greater energy efficiency. Per US EPA, energy use in homes, buildings, and industry account for about two-thirds of greenhouse gas emissions in the U.S. Energy audits are a first step to determine which upgrades and retrofits are needed for increased energy efficiency and reduced energy costs. As day-to-day building operations is a contributor to emissions, when maintenance is warranted improvements, upgrades, or renovations, as possible, could be integrated with an eye toward increasing energy conservation, e.g. improvements to insulation, appliances, and HVAC can create notable energy conservation.

Green Infrastructure

According to the US EPA, green infrastructure encompasses an "interconnected network of natural areas and other open spaces that conserves natural ecosystem values and functions, sustains clean air and water, and provides a wide array of benefits to people and wildlife." Green infrastructure is an effective tool for reducing energy consumption because it is usually vegetation-based, and so does not require electricity to function.

Table 13-11: Green Infrastructure and Energy Conservation Examples

<table>
<thead>
<tr>
<th>TYPE OF GREEN INFRASTRUCTURE</th>
<th>ENERGY CONSERVATION IMPACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greyfield &amp; Brownfield Redevelopment is the reuse of brownfields (abandoned or underused industrial or commercial properties with actual or perceived environmental contamination) or greyfields (empty or economically unviable malls or office centers).</td>
<td>Greyfield &amp; Brownfield Redevelopment reduces the need for new infrastructure by locating development in developed areas. It also reduces transportation fuel consumption.</td>
</tr>
<tr>
<td>Infill Development and Redevelopment involve reuse of vacant land and property within a built-up area for further construction or development, especially as part of neighborhood revitalization.</td>
<td>Infill Development and Redevelopment reduces the need for new infrastructure by locating development in developed areas. It also reduces transportation fuel consumption.</td>
</tr>
<tr>
<td>Green Roofs are roofs covered with a layer of vegetation. They absorb rainwater, provide insulation, create wildlife habitat, and help lower urban air temperatures.</td>
<td>Green Roofs provide insulation thus retaining energy, and reduce runoff thus reducing the need for the construction of brick and mortar stormwater management facilities.</td>
</tr>
</tbody>
</table>

Transportation and Parking Facilities

<table>
<thead>
<tr>
<th>TYPE OF GREEN INFRASTRUCTURE</th>
<th>ENERGY CONSERVATION IMPACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permeable Pavements e.g. pervious concrete, asphalt, or pavers allow precipitation to percolate into the soil below.</td>
<td>Permeable pavements reduce runoff thus reducing the need for constructing ‘brick and mortar’ storm water management facilities.</td>
</tr>
<tr>
<td>Green Parking techniques, e.g. alternative pavers in overflow parking areas, bioretention areas to treat stormwater, and shared parking reduce impervious cover.</td>
<td>Green Parking reduces runoff thus reducing the need for constructing ‘brick and mortar’ storm water management facilities.</td>
</tr>
<tr>
<td>Green Streets refers to a street that uses vegetated facilities to manage stormwater runoff at its source.</td>
<td>Green Streets reduce the need for constructing ‘brick and mortar’ stormwater management facilities.</td>
</tr>
</tbody>
</table>
Vegetated Swales are shallow channels with vegetation covering its slopes and bottom. They promote infiltration, reduce the velocity of runoff, and trap particulate pollutants e.g. suspended solids and trace metals. Vegetated Swales reduce runoff and trap pollutants, thus reducing the need for construction of brick and mortar storm water management and water purification facilities.

Shade Trees and Urban Forestry refers to the care and management of tree populations in developed settings to improve the urban environment. Shade Trees and Urban Forestry can reduce heating and cooling costs to nearby buildings.

Riparian Buffers are vegetated areas next to waterways that protect them from nonpoint source pollution while providing bank stabilization and wildlife habitat. Riparian Buffers trap pollutants and reduce runoff, thus reducing the need for ‘brick and mortar’ manmade stormwater management and water purification facilities.

Source: Chester County Planning Commission.

**Low Impact Development (LID)** is similar to Green Infrastructure, but it is used to describe land planning and engineering designs that manage stormwater runoff. LID emphasizes conservation and the use of on-site natural features to protect water quality and control runoff. This approach implements engineered small-scale hydrologic controls to replicate the pre-development hydrologic regime of watersheds through infiltrating, filtering, storing, evaporating, and detaining runoff close to its source. LID plays a role in energy conservation because it improves water quality without the operation of treatment plants.

### Municipal Programs and Operations

Municipalities can lead by example to achieve benefits of energy conservation and reduced energy costs by improving energy efficiency of buildings (existing, new, and renovations) and daily operations. Per US EPA, on average nationwide, energy costs can account for up to 10 percent of a municipal annual operating budget. Heating, cooling, lighting, and ventilation can make up as much as 70 to 80 percent of energy use in a municipal building. Completing an energy building audit, incorporating desired energy improvements into a capital improvements programs, including ‘green’ building measures in any future improvements, renovations, additions, or new structures, use of energy-efficient landscaping and exterior lighting practices, and recognizing success of energy efficiency efforts of other entities are some items the Township could undertake in a Township energy conservation program. Local recycling programs, which Kennett Township has in place, are one such straightforward way to implement energy conservation at the local level. In places with municipal-operated recycling programs, sale of recyclable materials (rather than paying a trash landfill tipping fee) is a way for a municipality to offset/recover a percentage of waste removal and disposal costs. US EPA Local Climate and Energy Program is designed to assist municipalities meet sustainability goals via training opportunities, planning information, and clean energy strategies. For more information refer to US EPA’s *Energy Efficiency in Local Government Operations*. PA DEP’s *Local and Municipal Energy Assistance* webpage provides information about developing municipal energy management plans.

### Waste and Wastewater Utilities

Utilities are large contributors of energy use as many operate 24 hours/7 days per week and should be an item of consideration, whether directly or indirectly, for local governments. Per US EPA, approximately 3 to 4 percent of electricity in the U.S. was used for treating and distributing potable water and treating wastewater. Nationwide on average, these facilities can represent up to 35 percent of municipal energy budgets. Water pumping and transport account for about 80 percent of energy use in water systems while aeration devices, e.g. sludge blowers, account for around 50 percent in wastewater systems. Increasing their energy efficiency and locating facilities (water and sewer infrastructure) and development within proximity to one another can reduce energy consumption and costs for local entities. For more information refer to US EPA’s *Energy Efficiency in Water and Wastewater Facilities*. 

**RECYCLING-ENERGY RELATIONSHIP**

- Recycling one pound of steel saves 5,450 Btu of energy, enough to light a 60-watt bulb for over 26 hours.
- Recycling one ton of glass saves the equivalent of nine gallons of fuel oil.
- Recycling aluminum cans requires only 5% of the energy needed to produce aluminum from bauxite.
- Recycling just one can saves enough electricity to light a 100-watt bulb for 3½ hours.

Source: USEPA
Resource Standards Summary

Kennett Township has addressed energy conservation in its regulations through renewable energy standards. Current energy conservation-related standards and the ordinance in which they are located are summarized in Table 3-12. Information regarding current measures helps to identify potential gaps so that recommendations can be made for improving Township regulations.

### Table 13-12: Kennett Township Energy Conservation-Related Standards Summary

<table>
<thead>
<tr>
<th>ZONING ORDINANCE:</th>
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<tbody>
<tr>
<td>§240-1943 Renewable Energy Systems</td>
<td>Provides regulations related to specific renewable energy systems. Allows Geothermal systems as accessory uses in all districts; Outdoor wood-fired boilers/hydronic heaters as accessory use in R-1, R-2, SA, BP, &amp; LI districts on lots of 10 acres or more; Solar systems as accessory uses in all districts &amp; a principal use by conditional use in the LI district; Wind systems as accessory uses in all districts; Manure/anaerobic digesters as accessory uses in the SA district on lots of 10 acres or more. Regulations take into account height, type and design of system, setbacks, natural &amp; historic resources, installation, glare (solar), and noise (wind) among other considerations.</td>
</tr>
<tr>
<td>§240-1400 PRD Planned Residential Developments</td>
<td>A purpose of which is to encourage innovations in residential development design to minimize energy consumption and maximize recycling of materials in its layout, transportation, climate control, energy sources and solid and liquid waste treatment systems.</td>
</tr>
<tr>
<td>§240-201 Definitions</td>
<td>Includes definitions for solar energy/system, wind turbine/tower, wind energy system/height, windmill, anaerobic digestion, geothermal energy system among others.</td>
</tr>
</tbody>
</table>

| SLDO: |  |
| §206-517 Conservation of Woodlands, Hedgerows, & Specimen Vegetation | Requires replacement plantings after land development activities using specific criteria including species/types/planting locations reflect site evaluation and functional objectives for having such replacement plantings, e.g. energy conservation among others. |

| SOLID WASTE ORDINANCE: |  |
| §192-2 Purpose | Implementing a recycling program to conserve energy are purposes of solid waste regulations among others. |
| §192-11 Leaf Waste & Grass Clippings | Requires leaf waste & grass clippings are composted, mulched, or used for agricultural purposes. | * SLDO – Subdivision and Land Development Ordinance

Planning Implications

→ **Balanced Energy Conservation Strategy** - Kennett Township’s mix of development and open areas make implementation of sustainability initiatives more challenging. The scattered nature of development in portions of the Township can discourage innovations, e.g. use of alternative transportation options in the foreseeable future. However, the increasing development in the Township grouped within proximity to one another in the areas around Kennett Square Borough and the Route 1 corridor may provide opportunities for sustainability and energy conservation, e.g. through using or building onto existing available road, sewer, and water infrastructure rather than building anew; use of public transit, bicycling, and pedestrian circulation options; as well as use of alternative fuel stations in the future. Township officials should remain aware of such opportunities.

More short-term strategies are to continue to require and encourage greater energy efficiency in new development design and building construction, and improve mixing of uses and walkability near and into the Borough, thereby helping to reduce overall individual personal vehicle use. Older structures can be costly to retrofit for certain energy efficient measures, but their continued use averts energy consumption from new construction, continues use of the energy already embodied from the construction and materials used in the older structure, as well as prevent possible significant waste from building demolition going in a landfill. Realistically, due to the suburbanized development patterns already existing in the Township, in the short term a Township strategy for pursuing energy
conservation will likely need to employ a balanced approach to optimize sustainability and energy conservation rather than attempt to maximize either.

**Energy Conservation through Township Initiatives** - The Township can initiate certain energy conservation efforts, e.g. continuing to review and update ordinances, building codes, and other regulations to permit and promote ‘greening’ in the Township including green infrastructure, alternative energy generation, and emerging technologies. Such efforts should also review all regulations already in place that may inadvertently limit the use of new energy conservation techniques. The Township can also serve in an educational role for its residents and businesses by using its facilities and equipment as demonstration projects showcasing new technologies, and by promoting energy efficient and sustainable projects of others. Recycling and redevelopment are some areas where the Township can play a leading role in improving efficiencies and technologies.

**Green Infrastructure and Low Impact Development** - The Township is well suited to benefit from energy conservation through the use of green infrastructure and low impact development. Encouraging the use of these design and infrastructure methods in new construction and in retrofits of older facilities can achieve a more sustainable overall infrastructure system for the future.

## Recommendations

### General

**13-1 Create a Township sustainability planning advisory committee.**

The Township has in place other advisory commissions to address and gather information for the Board of Supervisors about important Township and planning issues. While several of these commissions, e.g. KTPC, EAC, and KTHC, address certain elements of sustainability, no one entity looks at the ‘big’ picture in terms of sustainability and how all various elements fit and work together. West Vincent Township has such a committee in place that could be looked at as an example for this recommendation.

**13-2 Undertake a survey of Township residents, property owners, and businesses to gather voluntary baseline information about their practices, awareness, and interest in renewable energy, energy conservation, recycling, land stewardship, and other sustainability items.**

The Township could consider requesting a Sustainability Planning Advisory Committee to devise a survey of pertinent planning sustainability-related questions for distribution to residents, businesses, and property owners. This survey would be a ‘fact-finding mission’ for the Township to determine what initial direction to take in terms of sustainability implementation actions.

**13-3 Develop a Township-wide Sustainability Plan as an implementation component of the Township Comprehensive Plan.**

As a follow-up to this Comprehensive Plan update, the Township could consider undertaking a more holistic sustainability and energy conservation plan that implements Comprehensive Plan policies related to sustainability and energy conservation. A Township Sustainability Planning Advisory Committee could take the lead on the project with the assistance of a professional consultant that specializes in the topic of sustainability. Information gained from the survey (Action 13-2) could be used as a starting point on this planning effort.
13-4 Develop a Township Sustainability Checklist to measure, take into active consideration, and promote sustainability in Township projects, development proposals, ordinance revisions, and other activities.

To implement this Chapter and a Township-wide Sustainability Plan, a sustainability checklist can be developed as a way to gauge how well proposed development, other projects, and Township activities meet the Township’s sustainability objectives. Through this checklist, KTPC, Board of Supervisors, and other applicable advisory commissions/committees could be equipped with information and a benchmark to be used in review and deliberation of projects.

13-5 Develop Township measures to promote and recognize sustainable practices of residents and businesses in the Township.

Through a sustainability planning advisory committee, the Township could determine ways to best recognize and thus promote sustainable efforts in others. For example, the Township could create a sustainability recognition program or award to acknowledge businesses, residents, and other entities that have undertaken ‘greening’ practices. Consider implementing through KARPC a program similar to BLUER in West Chester, whereby a variety of sustainability efforts are promoted and acknowledged in various sectors. Consider an annual recognition prize to the ‘most frequent carpooler’ resident under DVRPC’s virtual Share-a-Ride program.

Natural Sustainability

13-6 Continue to update and implement natural resources protection measures through Township ordinances.

Township zoning and SLDO, among other ordinances, are in place to regulate and protect key natural resources and ecology in the Township. Natural resources are one element of a holistic sustainability program and continuing to maintain strong natural resources protection is an important part of implementing positive sustainability practices.

13-7 Identify and consider how to best remediate non-point source pollution.

Stormwater runoff takes the form of point source (generated and/or distributed from a single source, e.g. a drain pipe) or non-point sources (generated and/or distributed from multiple sources, e.g. across a parking lot). Water run-off that is uncontrolled and stemming from and/or going to multiple locations can create negative impacts on natural resources, e.g. stream bank erosion and soil sediment settling into the stream base; thus is counter to sustainable practices.

13-8 Continue to require septic systems be pumped at regular intervals.

An updated On-Lot (Septic System) Ordinance was recently adopted by the Board of Supervisors to meet current federal and state requirements. Regular pumping of septic systems helps maintain the system and reduces the likelihood of a potential future need for expansion of public sewer in the Township in order to replace failed septic systems. It also helps prevent potential stream or groundwater contamination as well as encroachment onto neighboring properties and for these reasons implements natural sustainability.

13-9 Continue the deer management program.

An increasing deer population sparked the creation of a Township deer management program years ago, whereby practices are encouraged that control the deer population to a more reasonable size in proportion to lands in the Township and development. The increased number of deer threatens the biodiversity of woodlands as deer browse on the buds, seedlings, and...
shoots of native species. This heavy browsing favors further establishment of aggressive, non-native plant species. From a natural sustainability perspective, creating an environmental that better balances deer population size with open lands available creates both a healthier habitat for deer and livable environment for humans.

13-10 Promote best soils practices for agricultural uses.

Preparing and maintaining soils using a best practices approach is consistent with natural sustainability by balancing and promoting agricultural production with reduced national resources damage. Over tilling of soil can result in soil erosion and loss of residual nutrients. Irrigating soil without proper drainage can result in over salinization. Sustainable agricultural practices entail optimizing farming production and minimizing efficient uses of resources, while taking into account ecology and environmental considerations. Reduced or conservation tilling allows at least 15 percent residential crop nutrients to remain in the soil, thus helping fertilize new crops, and promotes reduced soil run-off and erosion by providing a partial continuous residue coverage on soil. Long-term crop rotations, employing natural flooding cycles to continuously replenish nutrients into soil, use of bio-char to enhance soils, and use of crops already adapted to local or inhospitable conditions are other best practices.

13-11 Provide information about the benefits of food and yard waste composting and consider creating a facility for community composting at the Township maintenance facility property.

13-12 Promote the use and benefits of sustainable lawn care and landscaping best practices to residents, businesses, and on Township lands.

Lawns are one of the top 'crops' in the U.S. and contribute a substantial amount of stormwater run-off. Thus, how they are maintained, including pesticide and fertilizer treatments applied, affects natural resources, particularly water body and stream, health. There are many publications about taking a more sustainable approach to lawn care and landscaping, as noted in the table below from Connecticut’s Dept. of Energy and Environmental Protection. Sustainable lawn and landscaping practices include: use of native plants that are inherently suitable to local conditions and thus less costly, time consuming, and resource intensive to maintain; limited use of pesticides and fertilizers; use of low-height grass species that do not need mowing; reduced lawn size supplemented by groundcovers and other plantings; increased mulching of planting beds; allowing grass clippings to natural decompose and return nutrients to the lawn; promoting beneficial natural organisms (e.g. appropriate species of birds, bats, or spiders); and use of pruning and organic products to address landscaping issues, among other practices.

Using sustainable landscaping practices on Township-owned land serves energy conservation and cost efficiency objectives, as well as reestablishes natural and wildlife habitats. Portions of the Township Building Grounds are maintained in a more naturalistic state including grasses being more infrequently mowed to allow a meadow and promoting wildlife habitat as well as reducing stormwater run-off and potential carbon dioxide emissions from lawn care equipment. The catty-corner TLC New Leaf Eco Center showcases sustainable demonstration projects for residents. In order to showcase these types of projects to an even greater number of people the Township could partner with TLC to provide sustainable lawn care and landscaping demonstration projects on Township grounds as well.

Sustainable landscapes require less maintenance, reduce environmental harm, benefit wildlife, provide seasonal interest, use native plants, and encourage the use of local, renewable, and recyclable materials.

| Sustainable Landscaping Materials | • UConn’s Cooperative Extension resources on landscape construction helps you choose effective site construction techniques and materials to minimize water pollution.  
• Landscape For Life helps you choose materials that are healthier for the environment and your customers and perform as well or better than conventional materials. |
### Rain Gardens

A rain garden is a depression that collects runoff from a roof, driveway or yard and allows it to infiltrate into the ground. Rain gardens are typically planted with shrubs or perennials and can be colorful, landscaped areas in your yard that will also provide important environmental benefits. (Source: NEMO)

The following are from the training ‘Rain Gardens: How to Site, Design, Construct and Maintain Them’ (Nov. 2010), which was presented to the industry and community.

- **Rain Garden Overview and Design**, Michael Dietz, Ph.D., UConn, CT Nonpoint Education for Municipal Officials (NEMO)
- **Rain Garden Installation**, Rutgers, New Jersey Agriculture Experiment Station
- **Plant Selection and Care**, Caitrin Higgins, LEED, Rutgers
- **Rain Garden and Maintenance**, New Jersey Agriculture Experiment Station, Amy Boyajian
- **Bioretention Manual**, Dept. of Environmental Resource, Prince George's County, MD
- **Soil Infiltration Test**
- **Stormwater and the City**, Chet Arnold

### Native Plants

...native plants have adapted to the climate of a geographic area, making them naturally hardy. Wildlife has evolved using them for food, cover and shelter.

Proper selection, care and placement of trees and shrubs can produce a landscape that is both visually attractive and beneficial to wildlife.

- **Native Tree and Shrub Availability List** (pdf)
- **Invasive Species**
- **Plant Lists** (pdf) - salt tolerant, native plants/xeriscaping, stormwater ponds and wetlands
  - from Appendix A of the [CT Stormwater Water Quality Manual](https://www.epa.gov)/
- **Native Shrubs for Landscaping** - available from the DEEP bookstore. Describes Connecticut's resources for landscaping yards and gardens.

### Organic Land Care

- **What does organic land care mean?**
- Learn about [Organic Land Care Standards](https://www.ct.gov/caer/landcarestandards) and get accredited through CT Northeast Organic Farming Association (NOFA) courses.
- [Organic Land Care](https://www.ct.gov/caer/landcarestandards) for athletic and recreational fields
- **Organic Lawn Care** for residential lawns
- **Grassroots Healthy Lawn Program** is a pesticide reduction program designed to stimulate the supply and demand for natural lawn care by landscapers & homeowners.

### Composting and Grasscycling

A 1/2 acre lawn in New England produces over 3 tons or nearly 260 bags of grass clippings each year!

- Comprehensive information from the DEEP [compost](https://www.deep.state.ct.us) website about how to compost, sources of compost in CT, resources, videos and more.
- **Grasscycling** - leaving grass clippings on the lawn - can improve your customer’s lawns and save you money and time.

### Integrated Pest Management (IPM)

**IPM** is a systematic method of managing pests using non-chemical pest management methods and judicious use of pesticides when pest populations exceed acceptable levels.

### Low Impact Development (LID)

LID is a way to manage water that reduces the impact of built areas and promotes natural movement of water within an ecosystem or watershed. (Source: US EPA)

- LID uses site design principles and small-scale treatment practices to manage runoff volume and water quality at the source. For new development, LID uses a planning process to employ site design techniques to optimize conservation of natural hydrologic functions to prevent runoff. Learn more about [LID Guidelines and Standards](https://www.epa.gov)/ (pdf)
- **UA EPA, Low Impact Development**
- **Low Impact Development Center**

### Training

- **Grassroots Healthy Lawn Program** offers professional [training programs](https://www.ct.gov/caer/landcarestandards), and DVD learning tools for landscapers and municipal turf managers.

### Water Conservation

- Xeriscape landscapes are defined as “quality landscaping that conserves water and protects the environment.” Learn about the seven principles of [xeriscaping](https://www.epa.gov/)
- Find more information about [xeriscaping](https://www.epa.gov/), in the [CT Stormwater Water Quality Manual](https://www.epa.gov/), Section 5.4.1 Xeriscaping and General Landscape Management.

### Other Resources

- **Sustainable Landscapes** has information on rain gardens, rain harvesting, plant selections, green roofs, permeable pavements and more.
- US EPA’s [Soak Up the Rain](https://www.epa.gov/) website for citizens, businesses, and communities is about rain gardens, tree planting, rain barrels, permeable pavement, green roofs and more.
- **Sustainable Sites Initiative** is a program supported by the American Society of Landscape Architects to introduce sustainable standards of practice within a points-based system.
- **GreenScapes New England** provides cost-efficient and environmentally friendly solutions for landscaping.
### Economic Sustainability

#### 13-13 Support ‘value-added’ opportunities for agricultural uses, such as promoting secondary farm business opportunities and agricultural uses in the Township, and support connecting these uses to other entities that promote agricultural business.

Value-added opportunities can provide regional farmers with additional mechanisms to maintain their farms as economically viable by extracting more value from agricultural products and land, people, and capital. Smaller scale ‘family farms’ could add value to farming with secondary businesses, e.g. agri-tourism, resources-based recreation, specialized or niche markets, or hand crafts. Via appropriate ordinances and outreach, the Township can foster these opportunities in order to continue to preserve and maintain these operations in the area. Another value-added opportunity could be supporting agricultural uses to consider alternative energy generation in their lands and buildings in order to offset energy costs related to farming uses. Such accessory uses could include geo-thermal system to generate heating and cooling for farm buildings, or solar panels to generate electricity needed for farming uses.

Promoting continued and new additional agricultural uses is essential to maintaining the Township’s rural character. Allowing agricultural-related businesses to be located in proximity to one another is significantly helpful to their success and viability, as they have easier access to needed services and products and reduced potential for conflicts with incompatible land uses. Notoriously, residential developments located near agricultural uses can provide incompatibility due to odors, noise at early hours, and slow moving farm vehicles on roadways. The Township can ensure that zoning is such to minimize these incompatibilities. The Township can also foster agriculture in the Township by encouraging and possibly hosting agricultural forums with outside knowledgeable entities providing information on additional industry and business skills.

#### 13-14 Update Township ordinances and building codes, as needed, to continue to support home occupation uses.

Home occupations provide another form of economic development, provide work-life balance, and contribute to the labor force. In terms of sustainability, it allows persons to work from home, thus reduces commuting, carbon emissions, peak-hour traffic generation. PA MPC requires home-based businesses be permitted in zoning and the Township should promote their use through innovative regulations.

#### 13-15 Consider Township assistance for energy efficiency improvements and alternative energy installations.

For example, municipal assistance could be in the form of low-interest funding, Township real estate tax surcharge for recipients, or coordinating bulk purchasing, among other approaches.
Such a program might involve helping to coordinate the bulk purchase of efficient light bulbs, insulation or efficient faucet aerators for large numbers of residences, thus reducing homeowner individual costs. The Township newsletter and website could also serve as a tool for raising awareness about energy saving opportunities. For example, in recent years, utility providers have run programs that provide financial rebates to households who replace older, less efficient appliances, e.g. refrigerators and air conditioners, and other systems.

13-16  **Work to enhance multi-modal circulation opportunities.**

- Consider pedestrian and bicycle access and mobility options throughout the Township and particularly near the Borough, employment, and shopping locations.
- Promote DVRPC’s virtual Share-a-Ride carpooling program on the Township website.
- Work with KARPC to promote DART bus route/stops into the Township and connecting to Kennett Square Borough and the KARPC region.

### Social Sustainability

13-17  **Promote workforce housing in appropriate locations in the Township, while still maintaining the Township’s rural character.**

Workforce housing provides affordable housing options for persons earning a median income. To create such opportunities, house sizes are often smaller, on smaller lots, and possibly in a multi-family configuration. As well, locating these housing opportunities in developed areas within close proximity to existing public water and sewer infrastructure and alternative transportation options (walking, cycling, buses) allows greater and more economical options for residents. Designating growth areas for workforce housing within proximity to Kennett Square Borough and employment would allow for its future potential and would be consistent with Township plan policy for designating future development in appropriate areas.

13-18  **Work with local groups to build a publicly accessible, protected Township-wide trail and pedestrian system that connects to the regional network.**

A pedestrian and bicycle circulation network provides alternative and environmentally friendly transportation options as well as benefits those who do not have access nor desire to have personal vehicles for transportation and recreational purposes. In 2014, the Township created a Trails and Sidewalks Committee to examine existing pedestrian facilities and determine other areas suitable for to accommodate future pedestrian facilities in order to create an interconnected and publicly-accessible pedestrian network. Through this Committee, the Township can also work with local groups, e.g. TLC, New Garden Township, and Kennett Square Borough, among others, to identify needed links, secure those links via easements or fee purchase, blaze or pave links as needed, develop an ownership and maintenance plan. Once identified, such future desired linkage areas could be shown on the Township’s Official Map.

13-19  **Consider the need for additional public access parklands and open spaces for residents within the Kennett area.**

The Township should work with KARPC to examine where additional publicly accessible recreational lands could be located. For example, the need for a non-field all-season active recreation park and a regional park could be examined. Adequate public green areas contribute to a balanced landscape and are important for residents overall well-being and quality of life.

13-20  **Continue to promote historic resources protection and incentives for their continued viable use.**
Continuing use of historic structures allows materials and energy already embodied in its construction to be conserved. Historic buildings contribute to a community’s unique sense of place and public identity of ‘who this community is’. Retaining historic buildings provides a connection and collective reminder of a community’s past, telling the story of where the community came from, has been, and what the community has learned. Repurposing historic buildings for new contemporary uses increases diversity of the building stock, and thus allows places for a wider variety of uses.

13-21 **Continue to support community events that promote community engagement.**

Communication, outreach, and collaboration between the Township, residents, businesses, and other entities can be facilitated and enhanced via community events. Supporting recurring community events, which are free or low cost and thus accessible to a wide variety of people, establishes community traditions and connects people with the Township’s sense of place, culture, other community members, and organizations. It facilitates current and future community engagement, awareness, commitment, pride, and involvement.

13-22 **Continue to develop a multi-media Township communications strategy.**

In 2014, the Township made significant improvements to its website and audio-video public meeting recording equipment. Such improvements were made to enhance and create easier and broader communication with the public. The Township also generates a newsletter and provides email and/or mailed notifications to property owners about important public meetings in order to facilitate public communication, input, and involvement in Township policy and business. With rapidly and constantly changing technologies, the Township will need to continue examining methods for enhancing communications. To reach out to new property owners, businesses, and residents, the Township could consider putting together a Township ‘welcome wagon’ of materials about Township history, government, and community events, among other items.

13-23 **Establish and maintain a volunteer ‘staff’.**

Municipalities have limited funds for staff and significant and varied responsibilities to accomplish, and therefore heavily rely on volunteer ‘staff’ support to help accomplish goals. Township advisory committee, commissions, and boards all consist of residents and property owner volunteers. The Township is lucky to have had significant volunteerism throughout the years. In order to help facilitate and enhance the volunteerism spirit, the Township could consider creating a standing list of people and the types of activities they are interested and available to volunteer for. In this way, the Township would have a readily accessible list of available volunteers at any given time for specific tasks the Township needs to accomplish.

13-24 **Recognize resident, business, and Township volunteer contributions at an annual Township-sponsored event.**

An official mechanism to recognize and thank community volunteers is a good incentive and conveyance of gratitude to have in place in order to enhance continued and exceptional volunteerism. A yearly Township-sponsored event, e.g. a volunteer recognition dinner, could be considered.

**Energy Conservation**

The recommendations below are not specific to planning topics discussed other chapters. Energy conservation-related recommendations for specific planning topics have been integrated into their topic-specific chapter, e.g. green infrastructure discussion is in Chapter 10, and are not duplicated here.
Township-Related

13-25 Perform an energy audit on Township facilities and equipment to determine energy conservation measures that could be incorporated into Township buildings, vehicles, and operations.

An audit is the first step in understanding where Township operations currently stand in terms of modern energy conservation practices. Based on the findings, the Township can prioritize improvements based on return on investment, funding availability, and the condition of the existing building, vehicle, and other equipment and facilities.

13-26 Create and implement an Alternative Energy Plan for Township facilities.

Utility Infrastructure

13-27 Encourage the use of wastewater treatment and disposal technologies that reduce energy demands and recharge local groundwater.

13-28 Encourage the upgrade of electric power grid infrastructure to promote more efficient energy generation, conversion, storage, and transmission in meeting anticipated future electric consumption.

While the Township has no direct control of power generation and transmission, as possible the Township could advocate for system upgrades by power companies for the purposes of more energy and cost efficiency. Significant growing increases in use of various electronic devices and the burgeoning development of plug-in hybrid and all-electric vehicle will eventually require an increase in the amount of electricity generated, transmitted, and stored by utilities.

13-29 Encourage utility providers to improve energy efficiency in their operations.

While the Township’s role is largely limited to communication and advocacy in terms of utility providers, the Township can request that regional utilities and service providers cooperate with the Township’s policies on energy conservation.

Recycling, Reuse, Energy Efficiency Building, and Redevelopment

13-30 Support programs that offer consumers, including residents, businesses, and property owners, the opportunity to re-use items, goods, and materials that otherwise would be disposed in the garbage.

Removing items from the landfill bound waste stream extends the life of the landfill, prevents premature development of new landfills, and prevents disposal as ‘trash’ of otherwise usable items by another party. In addition to curbside recycling, donation or swapping of unwanted items is a method of reuse that has gained in use via the internet. ‘Free-cycling’ is a growing technique where individuals post notices on designated websites, offering to give away useful items that they no longer need, instead of disposing of these materials as ‘garbage’. Use of the Township newsletter and website to promote this type of reuse would further efforts to remove useful items from the landfill-bound waste stream and save energy in the process.

13-31 Provide information about the importance of recycling.

Township Code includes a recycling ordinance that shows the Township has already taken a key step in promoting and requiring recycling of material. To further this effort, the Township could
provide links to information about the benefits of recycling and could include informational materials and key facts about the importance of recycling in the Township newsletter.

**13-32 Support and provide information about energy efficiency upgrades and resource saving practices at home, school, and in the work place.**

As existing building infrastructure ages and needs replaced, or growth demands new facilities, the Township, school district, or other public partners can construct or restore buildings using new and more energy efficient techniques, and locate those facilities within existing developed areas. With an ongoing focus on energy conservation nationwide, grants and loan-interest may likely continue being available in the coming years for such projects. The Township can play a supporting role in educating residents, institutions, and businesses about energy efficiency via promoting community programs that address energy conservation improvements and topics. The Township can provide educational informational materials at local events and through the Township newsletter and website, covering topics such as weatherizing homes, Energy Star appliances and HVAC systems, using and/or filtering tap water rather using bottled water, as well as providing links to additional resources.

**13-33 Review Township ordinances and building codes to promote ‘greening’ practices, including green roofs, rain gardens, and constructed wetlands.**

Ordinance provisions can inadvertently prevent new technologies from occurring that implement Township energy conservation policies. Periodically, the Township should review ordinances to determine if there are provisions which could be limiting use of new ‘greening’ site and building planning. The Township has in place regulations for solar, wind, geothermal, and outdoor wood boiler power generation. On-site energy generation can be installed in residential, institutional, public, commercial, and industrial land uses, but related regulations need to take into account and be sensitive to site conditions and surrounding uses. As such, it may be appropriate to install modern solar panels in an industrial site, but not in a location visible from the public right-of-way in a historic district. When revising regulations, the Township should consider various issues related to on-site energy generation to allow its use while protecting surrounding uses and areas. Emerging technologies are increasingly minimizing the impact to surrounding land uses from on-site energy generators, and regulatory controls need to remain current to best serve Township residents, property owners, and businesses.

**13-34 Encourage via Township policy and regulation the redevelopment of existing sites and adaptive reuse or conversion of existing buildings for new uses.**

As an alternative to developing additional current ‘green open’ lands, reusing existing structures and redeveloping existing lots that already have building and site infrastructure, respectively, in place allows continued and enhanced use of prior development and the energy and materials involving in its construction.

**13-35 Promote and raise awareness about demonstration-projects that exhibit and implement energy conservation practices.**

The Township could encourage projects involving new construction, particularly those with a public focus, to incorporate energy conservation features and to exhibit those features for public tours and education. A good example is the Dansko headquarters in Penn Township, which displays how energy conservation features can be incorporated into construction, as well as shows how these features withstand daily use and can be maintained over time, and is used as a public education tool.