CITY OF GROSSE POINTE WOODS, MICHIGAN
20025 Mack Plaza Dr.
Planning Commission Meeting Agenda
October 25, 2011
7:30 p.m.

1. **CALL TO ORDER**
2. **ROLL CALL**
3. **PLEDGE OF ALLEGIANCE**
4. **ACCEPTANCE OF AGENDA**
5. **RECOGNITION OF COUNCIL REPRESENTATIVE/S**
6. **APPROVAL OF MINUTES**:
   Planning Commission – 09/27/11
7. **DISCUSSION: SOLAR PANELS**
   Memo – 10/19/11 – Building Official (Tutag)
   (1) National Trust for Historic Preservation Design Guidelines for Solar Installations
   (2) Site Design Strategies for Solar Access
   (3) Grosse Pointe Shores –Sample/Proposed Ordinance Amendment
   (4) St. Clair Shores DRAFT Ordinance
   (5) City of Novi Ordinance
   (6) Birmingham Ordinance
   (7) Charter Township of Bloomfield Ordinance
   (8) City of Ferndale Ordinance
   (9) Eastpointe Ordinance
   (10) Dundee Township Ordinance
   (11) Brownstown Township Ordinance
   (12) Monroe County, PA Ordinance
   (13) Kent County, MD Renewable Energy Task Force
   (14) Municipal Guide to Planning for and Regulating Alternative Energy Systems
   (15) Minnesota Environmental Quality Board – Model Environmental Energy Standards
8. **BUILDING OFFICIAL'S MONTHLY REPORT:**
   Building Department Report – September 2011
9. **COUNCIL REPORT**:
   Commission Member Dickinson
10. **INFORMATION ONLY - COUNCIL REPRESENTATIVE FOR NEXT MEETING:**
    Commission Member Evola

11. **NEW BUSINESS:**

Sub-Committee Reports:

2020 Plan (Chair Hamborsky/Vitale/Fuller/Gilezan)

Special Sign Ordinance (Chair Vaughn/Evola/Fuller)

12. **ADJOURNMENT**

Submitted by: Gene Tutag, Building Official 313-343-2426

IN ACCORDANCE WITH PUBLIC ACT 267 (OPEN MEETINGS ACT) POSTED AND COPIES GIVEN TO NEWSPAPERS

Notice: The City of Grosse Pointe Woods will provide necessary, reasonable auxiliary aids and services, such as signers for the hearing impaired, or audio tapes of printed materials being considered at the meeting to individuals with disabilities. All such requests must be made at least five days prior to said meeting. Individuals with disabilities requiring auxiliary aids or services should contact the City of Grosse Pointe Woods by writing or calling the A.D.A. Coordinator or the City Clerk's office, 20025 Mack Plaza, Grosse Pointe Woods, MI 48236 (313)343-2445; or Telecommunications Device for the Deaf TDD) (313)343-9249.

6.

PLANNING COMMISSION
09/27/11 – 038

MINUTES OF THE PLANNING COMMISSION OF THE CITY OF GROSSE POINTE WOODS HELD ON TUESDAY, SEPTEMBER 27, 2011, IN THE COUNCIL-COURT ROOM OF THE MUNICIPAL BUILDING, 20025 MACK AVENUE, GROSSE POINTE WOODS, MICHIGAN.

The meeting was called to order at 7:33 p.m. by Chair Vaughn.

Roll Call:	Chair Vaughn Dickinson, Evola, Fuller, Gilezan, Hamborsky, Richardson, Vitale
Absent:	None
Also Present:	Building Official Tutag Recording Secretary Babij Ryska

Also in Attendance: Council Member Ketels, Planning Commission Representative

The Commission, Administration, and audience Pledged Allegiance to the Flag.

Motion by Richardson, seconded by Dickinson, that all items on tonight's agenda be received, placed on file, and taken in order of appearance.

MOTION CARRIED by the following vote:

YES:	Dickinson, Evola, Fuller, Gilezan, Hamborsky, Richardson, Vaughn, Vitale
NO:	None
ABSENT:	None

Chair Vaughn welcomed Council Member Ketels, as Planning Commission Representative.

Motion by Evola, seconded by Richardson, regarding **Approval of Minutes**, that the Planning Commission Meeting minutes dated August 23, 2011 be approved.

MOTION CARRIED by the following vote:

YES:	Dickinson, Evola, Fuller, Gilezan, Hamborsky, Richardson, Vaughn, Vitale
NO:	None
ABSENT:	None

The next item on the agenda was the **Building Official's Monthly Report.** Mr. Tutag reported the following:

- Permit activity remains steady. There are a lot of remodeling jobs and a few built-in pools over the summer. People are investing in their homes.
- The Rivers project is still on track with getting their State permits. People have already expressed interest in the new units.

- The Cook Rd property is being checked periodically for wild life and other nuisances.

Commission Member Vitale gave the **Council Report**:

September 12, 2011

- Nothing to report pertaining to the Planning Commission.

September 19, 2011

- Council mentioned possible legislation that would give local governments authority to approve School Site Plans.

The following **Subcommittee Reports** were provided:

- **2020 Plan** – Commission Member Hamborsky stated that the subcommittee met and discussed some conceptual designs to improve Mack Ave and Vernier. They plan on meeting once a month.

- **Business & Development** – Commission Member Evola indicated that the members are in favor of disbanding the subcommittee at this time.

Motion by Evola, seconded by Dickinson, to disband the **Business & Development Subcommittee.**

MOTION CARRIED by the following vote:
YES: Dickinson, Evola, Fuller, Gilezan, Hamborsky, Richardson, Vaughn, Vitale
NO: None
ABSENT: None

- **Special Sign Ordinance** – Nothing to report.

Hearing no objections, the following items were heard under **New Business**:

- At a workshop prior to tonight's meeting, consensus of the Commission was to recommend no changes to Section 50-370(2)(h), pertaining to used and secondhand goods. The Commission discussed the draft memo to Council, distributed at the workshop.

Motion by Vitale, seconded by Fuller, to open discussion to review 50-370(2)(h) of the Code pertaining to used and secondhand goods.

MOTION CARRIED by the following vote:
YES: Dickinson, Evola, Fuller, Gilezan, Hamborsky, Richardson, Vaughn, Vitale
NO: None
ABSENT: None

Motion by Dickinson, seconded by Richardson, that the Planning Commission recommend to Council that no changes be made to **Section 50.370(2)(h)** of the City Code regarding used and secondhand goods and approve the memo subject to Planning Commission Chair, Building Official, and City Attorney approval and forward the memo to the City Council.

MOTION CARRIED by the following vote:
YES: Dickinson, Evola, Fuller, Gilezan, Hamborsky, Richardson, Vaughn, Vitale
NO: None
ABSENT: None

- Chair Vaughn inquired as to what might be seen on future Planning Commission agendas. Building Official Tutag recommended discussing solar and wind power regulations in the near future. The Commission agreed that this is viable topic.

- Commission Member Hamborsky asked if any developers have expressed interest in the Mixed Use Ordinance. Building Official Tutag informed the Commission that there has not been any inquiries, however, as the economy stabilizes there will likely be an interest.

- Chair Vaughn stated that the Grosse Pointe Woods Foundation held a fundraiser and is requesting suggestions on how to utilize the funds. Some members of the Foundation are interested in public art. Building Official Tutag recommended a tasteful electronic changeable sign that announces upcoming community events either at Vernier and Mack or in front of City Hall.

Motion by Evola, seconded by Dickinson, to adjourn the Planning Commission meeting at 8:06 p.m. Passed unanimously.

7.

CITY OF GROSSE POINTE WOODS

BUILDING DEPARTMENT

MEMORANDUM

TO: Planning Commission

FROM: Gene Tutag, Building Official GT

DATE: October 19, 2011

SUBJECT: Solar Panels / Wind Energy Ordinance

For discussion at the October meeting, included in your packets are ordinances and information regarding the planning for and regulation of solar and wind energy systems. The purpose of the discussion would be to determine if zoning regulations are needed to regulate the installation and operation of small wind and solar renewable energy systems in the city.

Currently there are no installations of this type in the city or applications pending.

The ordinances that are attached give us a glimpse into how other communities are regulating these uses.

The purpose of this ordinance would be to:

1. Provide zoning regulations to guide the installation and operation of Small Wind and Solar Renewable Energy Systems in the City of Grosse Pointe Woods.

2. Accommodate sustainable energy production from renewable energy sources.

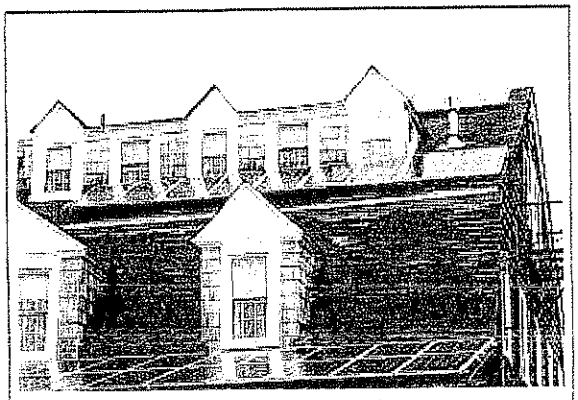
3. Preserve the aesthetics of the city in the interest of property values, public health, and welfare.

If the Planning Commission decides to go forward with an ordinance, the language should be presented to the City Council at a COW meeting prior to the scheduling of a Public Hearing.

NATIONAL TRUST FOR HISTORIC PRESERVATION

Design Guidelines for Solar Installations

In many cases, historic buildings, structures, and sites can be preserved while also accommodating solar energy installations. Indeed, as the need for renewable energy systems increases, technology evolves, political pressure to remove regulatory barriers mounts, and logistical problems are resolved, precluding the installation of solar energy systems may become indefensible. Moreover, with incentives in place, applications to install solar and other alternative energy systems within historic districts are likely to increase dramatically. Just as state agencies and local preservation boards developed policies and guidelines to address the needs of persons with disabilities, they should also develop policies that encourage compatible and appropriate installations of solar energy systems.



Solar panels on the Spring Lake Inn in New Jersey.

Credit: Adrian Scott Fine

The following considerations can facilitate preservation boards and commissions in their review of solar panel requests and provide a foundation for the adoption of local guidelines related to solar energy installations. The primary objective of preservation ordinances is to preserve historic properties, so a preservation board should encourage project outcomes that meet solar access requirements while maintaining the integrity of historic resources. Consideration should always be given to solutions that protect historic features, materials, and spatial relationships with the visibility of all solar energy installations – including solar panels – minimized to the greatest extent possible.

Locate solar panels on the site of a historic resource. If possible, use a ground-mounted solar panel array. Consider solutions that respect the building's historic setting by locating arrays in an inconspicuous location, such as a rear or side yard, low to the ground, and sensitively screened to further limit visibility. Care should be taken to respect the historic landscape, including both its natural (i.e. topography) and designed (i.e. materials) features.

Locate solar panels on new construction. In cases where new buildings or new additions to historic buildings are proposed and approvable, encourage the placement of solar panels on the new construction. To achieve overall compatibility with the historic building and its setting, consider solutions that integrate the solar panel system in less visible areas of the new design.

Locate solar panels on non-historic buildings and additions. If the site cannot accommodate solar panels and the project does not include new construction, consider placing solar panels on an existing, non-historic addition or accessory structure. This will minimize the impact of solar installation on the significant features of the historic resource and protect the historic fabric against alteration.

Place solar panels in areas that minimize their visibility from a public thoroughfare. The primary façade of a historic building is often the most architecturally distinctive and publicly visible, and thus the most significant and character defining. To the greatest extent possible, avoid placing solar panels on street-facing walls or roofs, including those facing side streets. Installations below and behind parapet walls and dormers or on rear-facing roofs are often good choices.

Avoid installations that would result in the permanent loss of significant, character-defining features of historic resources. Solar panels should not require alterations to significant or character-defining features of a historic resource, such as altering existing roof lines or dormers. Avoid installations that obstruct views of significant architectural features (such as overlaying windows or decorative detailing) or intrude on views of neighboring historic properties in an historic district.

Avoid solutions that would require or result in the removal or permanent alteration of historic fabric. Solar panel installations should be reversible. The use of solar roof tiles, laminates, glazing, and other technologies that require the removal of intact historic fabric or that permanently alter or damage such fabric must be avoided. Consider the type and condition of the existing building fabric for which solar panels installation is proposed, as well as the method of attachment and future removal. Minimizing the number of points of attachment, including the use of brackets, will avoid damaging historic fabric.

Require low profiles. Solar panels should be flush with – or mounted no higher than a few inches above – the existing roof surface. They should not be visible above the roofline of a primary façade.

On flat roofs, set solar panels back from the edge. Because they are generally hidden from view, flat roofs can provide an ideal surface for solar panel arrays. To ensure that a solar installation is minimally visible, set the solar panels back from the roof's edge and adjust the angle and height of the panels as necessary.

Avoid disjointed and multi-roof solutions. Solar panels should be set at angles consistent with the slope or pitch of the supporting roof. For example, avoid solutions that would set panels at a 70 degree angle when the roof pitch is 45 degrees. In addition, solar panels should be located on one roof plane (as opposed to scattered among several roofs) and arranged in a pattern that matches the general shape and configuration of the roof upon which they are mounted.

Ensure that solar panels, support structures, and conduits blend into the surrounding features of the historic resource. The overall visibility and reflectivity of solar panels and their support structures can be substantially reduced if elements of the solar installation match the surrounding building fabric in color.

Site Design Strategies for Solar Access

Introduction

A great deal of attention has been placed on the role of sustainable building design and construction techniques in recent years. Many communities have adopted standards that encourage or require compliance with programs such as the Leadership in Energy and Environmental Design (LEED) Green Building Rating System™. The LEED system has become the nationally accepted benchmark for the design, construction and operation of high performance green buildings. The program encourages the use of products and techniques to promote sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality.[1]

Much less emphasis, however, has been placed on the role of site planning in a sustainable design program—and more specifically, on site design for solar access. The incorporation of both active and passive solar techniques are integral to any discussion of green building design, yet in order for either approach to be viable, the systems must have unobstructed solar access for a certain period of each day. Without careful consideration of solar access during the planning stages of new development, future opportunities for the installation of both active and passive features can be dramatically reduced or even eliminated altogether.

In order to ensure that the sustainable features are considered in relation to the entire development site, not just what falls within the building envelope, planners and architects must take additional, concerted measures. A pilot program currently being developed by the U.S. Green Building Council (USGBC) entitled LEED for Neighborhood Development or "LEED ND"[2], represents an important step towards broader consideration of solar access. For now, the application of these provisions is limited primarily to individual developers who choose to use them. Zoning regulations play a significant role in the implementation of solar energy technologies at the local level, defining where, how, and when they may be used. Many communities have recognized the importance of addressing solar access within their zoning regulations and have taken steps to define the degree to which solar energy will be allowed, encouraged, or even required.

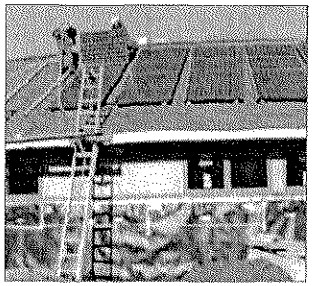
Implications of Not Addressing the Issue

The implications of not establishing provisions for solar access at the local level are significant. At the most basic level, the opportunity for a community to reduce its energy consumption is diminished substantially. Without provisions in place to insure solar technologies are permitted and that access to them is protected, solar technologies become more difficult and costly to implement—and therefore, may be passed over by all but the most "green" developers and homeowners. Choosing not to establish solar access provisions may also prove costly to local governments because of increases in the staff time necessary to process variances and other requests.

Some utility companies are also increasingly, though tentatively, supportive of measures that encourage solar access for new and existing development. As they grapple with aging and overburdened power production facilities, utilities are faced with the prospect of having to construct costly new power plants and infrastructure to accommodate the ever increasing demand for power. This cost is in turn transferred to power consumers. Municipalities that choose to enact solar access provisions can, to a certain point, help insulate their constituents from such cost increases without detrimentally affecting utilities.

On the other hand, establishing solar access provisions can be beneficial at a variety of levels. At the site planning level, organizing new development to achieve proper solar orientation can improve the energy efficiency of buildings on the site at little or no additional cost. When combined with other sustainable building techniques, the benefits of requiring and/or protecting solar access can be dramatic. For example, placing a building's long face on an east-west axis with a large percentage of its windows on the south side can reduce fuel consumption by up to twenty-five percent.[3] In its Solar Access

[1] U.S. Green Building Council, LEED Rating Systems. Available online. Last accessed online 10/30/08.
[2] U.S. Green Building Council, LEED Rating Systems. Available online. Last accessed online 10/30/08.
[3] Guide: Putting Renewable Energy to Work in Buildings. Available online. Last accessed online 10/30/08.



Design Manual, the City of San Jose, California found that proper solar orientation of new homes built in the San Jose area produced a total energy savings of eleven to sixteen percent—with up to forty percent savings generated from space cooling.[4] In addition to promoting a measurable reduction in energy usage, solar access provisions can also help ensure that the conversion of homes from traditional energy sources to solar energy over time can be accomplished relatively easily. Homes that are pre-designed to accommodate solar devices, not only from a site planning standpoint, but from a plumbing, wiring and structural standpoint can make future installations much easier and less costly.

Goals for Solar Access

While this chapter cites numerous examples of local governments adopting regulations to protect solar access opportunities, there is still much to be done. This section outlines specific strategies and actions to be taken by communities wishing to elevate and enhance solar access-related policies. A range of examples are provided to help illustrate how these strategies can be adapted to a variety of situations depending on the level of policy commitment, available staff resources and political environment.

The primary goals of this chapter are to:

- Remove regulatory obstacles and streamline processes for the installation of solar technologies
- Implement protective regulations to ensure that property owner investments in solar technologies are protected
- Preserve the opportunity for increased use of solar technologies in the future
- Provide incentives for the use of solar technologies in new construction and in the renovation of existing homes
- Promote an overall reduction in energy usage

RMLUI
Rocky Mountain Land Use Institute

[4] City of San Jose, California. Solar Access Design Manual

Photos: Left and right, "Taking the Lead in Building Production-Style Solar Homes", by Peter Hillebrandt. Available online. Last accessed online 10/29/08. Center, U.S. Department of E Series, High-Performance Home Technologies: Solar Thermal and Photovoltaic Systems. Available online. Last accessed online 10/29/08

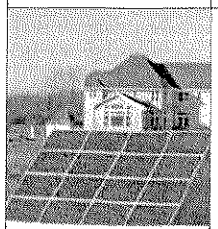
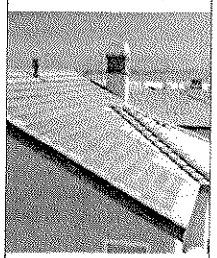
Sustainable Community Development Code Framework

RENEWABLE ENERGY

KEY STATISTICS:

- Only about nine percent of electricity in the U.S. is generated from renewable sources
- Most electricity in the U.S. is generated by burning nonrenewable fossil fuels
- Proper solar orientation of new homes built in the San Jose area produced total energy savings of eleven to sixteen percent—with up to forty percent savings from space cooling
- Placing a building's long face on an east-west axis with a large percentage of windows on the south side can reduce fuel consumption by up to twenty-five percent
- Between 200,000 and 250,000 U.S. homes and businesses have solar panels today, a number that has increased by more than forty percent a year since Congress passed a federal tax credit for solar energy in 2005

SITE DESIGN STRATEGIES FOR SOLAR ACCESS

		ACHIEVEMENT LEVELS (Note: higher levels generally incorporate actions of lower levels)				
		Bronze (Good)	**Silver (Better)**	**Gold (Best)**	**References/Commentary**	**Code Examples/Citations**
 	**Remove Obstacles**	▪ Identify provisions that limit solar access (e.g., accessory structure limits, historic district regulations) and craft exceptions to permit solar energy devices ▪ Prohibit solar restrictions in new private CC&Rs in subdivision regulations	▪ Allow modest adjustments to side, front and/or rear yard setback requirements (or other conflicting regulations) that allow applicants to meet solar access requirements	▪ Override existing private covenants restricting solar devices ▪ Allow solar panels as a by-right accessory use except in special districts (e.g., historic districts)	▪ In the last five years, advances in technology have resulted in photovoltaic systems that can be installed in some roofing systems to make them nearly invisible—providing an alternative to tradition panels in areas where aesthetics are of significant concern (e.g., historic districts). See US Department of Energy, *Building America Best Practices for High-Performance Technologies: Solar Thermal & Photovoltaic Systems.* Available online. Retrieved February 8, 2011. ▪ The LEED ND pilot program incorporates a section on Solar Orientation intended to "achieve enhanced energy efficiency by creating the optimum conditions for the use of passive and active solar strategies." The section is one of twenty potential credits under the section entitled *Green Construction & Technology.* Available online. Retrieved February 8, 2011.	▪ City of Los Angeles, CA, *Historic Preservation Overlay.* Available online. Retrieved February 8, 2011. ▪ City of Fort Collins, CO, Land Use Code, Solar Access, Orientation, and Shading. Available online. Retrieved February 8, 2011. ▪ City of Gresham, OR, *Oregon Development Code, Solar Access Standards.* Available online. Retrieved February 8, 2011. ▪ Multnomah County, OR, *Solar Access Provisions for New Development.* Available online. Retrieved February 8, 2011. ▪ City of Berkeley, CA, *Title 23 (Zoning Ordinance) Section 23D.04: Lot and Development Standards.* Available online. Retrieved February 8, 2011. ▪ Teton County, WY, *Solar Access Regulations.* Available online. Retrieved February 8, 2011.

Sustainable Community Development Code Framework

RENEWABLE ENERGY

	Bronze (Good)	Silver (Better)	Gold (Best)	References/Commentary	Code Examples/Citations
Create Incentives	▪ Reduce or eliminate permit fees for the installation of solar devices on an existing structure	▪ Reduce building permit fees for projects that incorporate solar concepts in the overall design ▪ Provide staff assistance to homeowners to orient new homes for solar access	▪ Allow applicants to "earn" additional density or height by incorporating solar concepts into a project's overall design	▪ *Database of State Incentives for Efficiency and Renewables* (DSIRE). Available online. Retrieved February 8, 2011. ▪ City of Tucson, AZ, offers a tiered Solar Fee Incentive Waiver for new construction and renovation. Available online. Retrieved February 8, 2011. ▪ City of Oakland, CA expedited its solar energy use through a 2001 initiative that waived design review requirements for installation of solar production facilities. The initiative expired in 2003; however, the city is evaluating the impact of this ordinance and evaluating the feasibility of its continuance. ▪ A range of articles and other materials on renewable energy are available in the American Planning Association's February 2008 PASInfoPacket entitled Planning and Zoning for Renewable Energy. Available online. Retrieved February 8, 2011.	▪ Eagle County, CO, *Efficient Building Code*. Available online. Retrieved February 8, 2011. ▪ City of Austin, TX, *Development Code: Subchapter E: Design Standards and Mixed-Use*. Available online. Retrieved February 8, 2011. ▪ City of Pullman, WA, *Development Code, Planned Residential Development Section 17.107* (incentives for solar access). Available online. Retrieved February 8, 2011.
Enact Standards	▪ Require key features of a development plan to have access to sunshine ▪ Enact regulations to preserve solar access	▪ Require variation in width of lots to maximize solar access ▪ Include solar access as an optional or required standard in residential and commercial design guidelines ▪ Establish a tree dispute resolution process and criteria whereby property owners can resolve issues regarding the obstruction of solar access to a property by a tree or trees on a neighboring property	▪ Require a minimum percentage of solar-oriented lots or buildings in new developments ▪ Require a minimum percentage of energy in new developments to come from solar	▪ *State of New Mexico Solar Collector Standards Act*. Available online. Retrieved February 8, 2011. ▪ U.S. Department of Energy, *Building America Best Practices for High-Performance Technologies: Solar Thermal & Photovoltaic Systems*. Available online. Retrieved February 8, 2011. ▪ Guide: Putting Renewable Energy to Work in Buildings. Available online. Retrieved February 8, 2011.	▪ City of Fort Collins, CO, *Colorado Land Use Code, Solar Access, Orientation, and Shading*. Available online. Retrieved February 8, 2011. ▪ City of Portland, OR, *Solar Access Regulations*. Available online. Retrieved February 8, 2011. ▪ Teton County, WY, *Solar Access Regulations*. Available online. Retrieved February 8, 2011.

Sustainable Community Development Code Framework

RENEWABLE ENERGY

		Bronze (Good)	Silver (Better)	Gold (Best)	References/Commentary	Code Examples/Citations
	Enact Standards		▪ Require buildings to be solar ready. Key considerations for solar readiness include: orientation for solar exposure, wiring, plumbing, and roof structures pre-designed to handle solar collectors		▪ U.S. Green Building Council, *LEED for Neighborhood Rating System* (See Green Construction and Technology chapter). Available online. Retrieved February 8, 2011.	▪ City of Ashland, OR, Municipal Code. Available online. Retrieved February 8, 2011. ▪ City of San Francisco, CA, *Tree Dispute Resolution Ordinance*. Available online. Retrieved February 8, 2011. ▪ City of Berkley, CA, *Title 23 (Zoning Ordinance) Section 23D.04: Lot and Development Standards*. Available online. Retrieved February 8, 2011. ▪ City of Boulder, CO, *Solar Access Regulations*. Available online. Retrieved February 8, 2011. ▪ City of San Luis Obispo, CA, *Municipal Code: Section 16.18.170, Easements for Solar Access*. Available online. Retrieved February 8, 2011. ▪ Village of Prairie du Sac, WI, Land Use Regulations, Chapter 8: Solar Access. Available online. Retrieved February 8, 2011. ▪ Clackamas County, OR, *Zoning and Development Ordinance, Solar Access Ordinance for New Development*. Available online. Retrieved February 8, 2011.

Grosse Pointe Shores Planning Commission
Proposed Ordinance Amendment
Solar Panels – Green Ordinance
April 20, 2011

Sec. 40-264. Solar Panels and Shingles (or the like).

The use of solar panels and shingles (or the like) for private use shall be subject to special land use approval and the following requirements:

(1) Freestanding

(a) Freestanding solar panels shall not be located in the front or side yard;
(b) All freestanding solar panels shall be regulated as an accessory structure and shall meet all applicable accessory building requirements of the ordinance;
(c) Solar panels shall be counted as part of the maximum permitted impervious surface/lot coverage ratio requirements of the zoning district in which it is located;
(d) No freestanding solar panel shall be permitted to exceed a height of fifteen (15) feet at any point;

(2) Roof or Structural Mounted

(a) Shall not project more than one (1) foot feet above the roof line (Does the Commission want panels to extend above the maximum permitted height of the district?), flat mount panels or solar shingles are preferred;
(b) May be constructed on any façade or roof surface of an existing structure. (Does the Commission want to regulate the visibility of roof mounted panels/shingles; this may not provide optimal positioning of the panels).
(c) Shall not be located within three (3) feet of any peek, eave or valley to maintain adequate accessibility.

(3) Requirements for All Panels (Freestanding or Roof Mounted/Integrated)

(a) In addition to building and electrical reviews, the solar panels, solar shingles and arrays of panels shall also be reviewed by the Fire Department.
(b) The panel array shall be fitted with an automatic shut off or breaker switch as approved by the Fire Department to isolate the panels in case of fire.
(c) The Fire Department shall keep on file the type of system that the solar panel array is a part of, either photovoltaic, thermal or other.
(d) All panels shall have tempered, non-reflective surfaces.
(e) It shall be shown that all panels are adequately secured to the surface upon which they are mounted and that the mounting structure has the capability of supporting the panels.
(f) The installation of the panels shall not require or be reliant on the clear cutting of trees or other vegetation.
(g) All solar panels shall be subject to Planning Commission review and special land use approval. (Does the Commission want solar panels to come before them and City Council and have a public hearing?)

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December 14, 2010

Mr. Elizabeth Koto, AICP
City Planner
City of St. Clair Shores
27600 Jefferson Circle Drive
St. Clair Shores, MI 48081

Re: Renewable Energy and Alternative Fuel Vehicle Zoning Ordinance Amendments

Dear Ms. Koto;

The following series of amendments are designed to create a set of regulations for renewable energy structures and alternative fuel vehicle parking and charging station. They include a series of amendments to Articles II and XIX.

ARTICLE II

(Amend Section 15.022, inserting new subsections identified below)

15.022 DEFINITIONS

(73.5) PARKING SPACE, ALTERNATIVE FUEL VEHICLE: A parking space specifically set aside for the parking of hybrid or alternative fuel vehicles. Such spaces may or may not be provided with electric automobile recharging equipment.

(80.50) SOLAR ACCESS EASEMENT: A right, expressed as an easement, covenant, condition or other property interest in any deed or other instrument executed by or on behalf of any landowner, which protects the solar skyspace of an actual, proposed or designated solar energy collector at a described location by forbidding or limiting activities, land uses, structures and/or trees that interfere with access to solar energy. The solar skyspace must be described as the three (3) dimensional space in which obstruction is prohibited or limited. Any property owner may give or sell his right to access to sunlight. Such Solar Access Easements shall be recorded and copies shall be kept on file with the St. Clair Shores Community Development Department.

(80.51) SOLAR COLLECTOR: A device or combination of devices, structures, or parts thereof, that collects, transfers or transforms direct solar, radiant energy into thermal, chemical, or electrical energy, and that contributes significantly to a structure's energy supply. In addition to such functions, solar collectors may also serve as a part of a structure's roof, wall, window or

other structural member.

(80.52) SOLAR ENERGY: Radiant energy (direct, diffuse, and reflected) received from the sun.

(80.53) SOLAR ENERGY STRUCTURE, ACTIVE: A structure which utilizes mechanically-operated solar collectors to shift positions to optimize its ability to collect, transfer or store solar energy.

(80.54) SOLAR ENERGY STRUCTURE, PASSIVE: A structure which collects, transfers or stores solar energy, but is static.

(80.55) SOLAR SKYSPACE: The space between a solar energy collector and the sun which must be free of obstructions that shade the collector to an extent which precludes its cost-effective operation.

(84.5) TEMPORARY METEOROLOGICAL TOWERS (TMT): A tower of monopole design which is designed and built to hold wind resource testing devices such as anemometers, wind vanes and accessory equipment and which is to remain in place for no more than eighteen (18) months.

(89.5) WIND ENERGY CONVERSION SYSTEM (WECS): Any device such as a turbine, windmill or charger that converts wind energy to a usable form of energy. WECS shall fall within two (2) classifications: on-site or commercial, and shall typically be defined as horizontal-axis or vertical-axis.

A. **ON-SITE WIND ENERGY CONVERSION**: A WECS, the energy from which is used only by the primary residence or residences in a cooperative effort, business or agricultural operation and not sold or transferred to the electrical grid for commercial profit. This does not exclude the sale of excess energy sold to a utility through net metering for on-site WECS when the WECS produces more energy than can be stored or used on-site.

B. **COMMERCIAL WIND ENERGY CONVERSION SYSTEM**: Any WECS that is exclusively designed and built to provide electricity to the electric utility's power grid as an ongoing commercial enterprise or for commercial profit.

C. **HORIZONTAL-AXIS WIND ENERGY CONVERSION SYSTEMS**: Conventionally designed systems that have a main rotor shaft that is parallel to the ground and a series of "blades" that are perpendicular to the ground, as in a traditional agricultural windmill. Horizontal-axis wind energy conversion systems are traditionally mounted on a tower or pole and must be pointed into the wind.

D. **VERTICAL-AXIS WIND ENERGY CONVERSION SYSTEMS**: Systems that have a main rotor shaft that is perpendicular to the ground and the system does not need to be pointed into the wind. These systems are more common in areas where wind direction is

variable. These systems often resemble a drum, cylinder, or helix.

ARTICLE XIX

(Amend Sections 15.499 and 15.500, inserting the new subsections identified below)

15.499 ACCESSORY BUILDINGS/STRUCTURES

(15) Accessory buildings/structures may be provided with 110 volt electrical service. Voltage in excess of 110 volts shall be prohibited, with the exception of service specifically dedicated for electric automobile recharging equipment.

15.500 OFF STREET PARKING REQUIREMENTS

(14) Alternative fuel vehicle parking spaces shall satisfy the requirements for two conventional parking spaces. Alternative fuel vehicle parking spaces may be provided with the following conditions:

(a) Alternative fuel vehicle parking spaces shall be given priority with regard to location adjacent to the primary entrance of the building for which they are intended, exclusive of barrier-free spaces provided to meet Americans with Disabilities Act requirements.

(b) Alternative fuel vehicle parking spaces may be provided at a maximum rate of one space for every 20 provided conventional spaces (or 21 required spaces, given the permitted reduction of required spaces granted by the inclusion of the Alternative fuel vehicle parking space).

(c) Alternative fuel vehicle parking spaces must be provided with unique identification similar to that provided for barrier-free spaces provided to meet Americans with Disabilities Act requirements, but with distinct color striping and signage to indicate that the space is exclusively reserved for use of hybrid and alternative fuel vehicles. The Community Development Department shall maintain standards for striping, signage, and other conditions relating to alternative fuel vehicle parking spaces. Such standards shall be made available to the public.

(d) Alternative fuel vehicle parking spaces may or may not have electric automobile charging equipment, but all spaces provided with electric automobile charging equipment shall be designated an alternative fuel vehicle parking spaces, and shall be subject to the provisions of this Section, including priority location.

(e) Electric automobile charging equipment may be permitted in residential districts. When provided in residential districts, the presence of electric automobile charging equipment shall not mandate the designation of the parking space served

as an alternative fuel vehicle parking space. All electric automobile charging equipment must be located within an enclosed garage or within a side or rear yard if ground mounted or mounted on a structure.

(f) Electric automobile charging equipment, when provided, shall be permitted in all Districts, provided the owner and operator of the equipment, and owner of the land on which the equipment is located are each responsible for ensuring that the installation, operation, use and removal of the equipment complies with all applicable state, federal and local laws, ordinances and regulations, and shall submit proof of such compliance to the City upon request. Further, such operator and owner shall each defend, indemnify and hold harmless the City from and against any and all loss, liability, cost or expense incurred by the City as a result of any failure or malfunction of the equipment to comply with applicable laws, ordinances or regulations.

(Insert new Sections 15.511, 15.512, 15.513)

15.511 WIND ENERGY CONVERSION SYSTEMS

A. **Intent**. It is the intent of the City to permit the effective and efficient use of Wind Energy Conversion Systems (WECS) by regulating the siting, design, and installation of such systems to protect the public health, safety, and welfare, and to ensure compatibility of land uses in the vicinity of WECS. This Ordinance does not establish or guarantee air or light or wind rights or establish access to the air, light, or wind.

B. **Applicability**. It shall be unlawful to construct, erect, install, alter, or locate any WECS or Temporary Meteorological Tower (TMT) within the City except in compliance with the section. A building permit is required for any WECS or TMT pursuant to this Section.

C. **On-Site WECS Permitted**. On-site WECS or TMT shall be considered a permitted use in all zoning districts, subject to the provisions of this Section. Applications for an on-site WECS shall include the following:

1. Applicant Information. Name, address and contact information.

2. Project Description. A general description of the proposed project as well as a legal description (property identification number) of the property on which the project would be located.

3. Plot Plan and Documentation. The Plot Plan shall include maps showing the physical features and land uses of the project area, both before and after construction of the proposed project. The plot plan shall include:

   a. The project area boundaries.

b. The location, height and dimensions of all existing and proposed structures and fencing.

c. Distance of proposed structure from all property lines and permanent structures.

d. The location, grades and dimensions of all temporary and permanent on-site access roads.

e. Existing topography.

f. Water bodies, waterways, wetlands, and drainage ditches (county drains).

g. All new above ground infrastructure related to the project.

h. The location of all overhead utility wires.

4. Additional Documentation.

a. Insurance. Proof of the applicant's appropriate liability insurance.

b. Sound Pressure Level. Documentation of the manufacturers designed sound pressure levels (decibels) for unit to be installed.

c. Certifications. Certification that applicant has complied or will comply with all applicable state and federal laws and regulations.

d. Grant of Authority. The applicant shall provide evidence of ownership of the land which the WECS or Temporary Meteorological Tower is to be located and the written consent of the land owner if different from the applicant. If the applicant is leasing land the applicant shall provide a copy of the lease agreement and the land owner's written authorization for the applicant to construct the structure.

e. Compliance with Laws and Regulations. The applicant, operator of the WECS or TMT, and owner of the land on which the WECS or TMT is located are each responsible for ensuring that the installation, operation, use and removal of the WECS or TMT complies with all applicable state, federal and local laws, ordinances and regulations, and shall submit proof of such compliance to the City upon request. Further, such applicant, operator and owner and shall each defend, indemnify and hold harmless the City from and against any and all loss, liability, cost or expense incurred by the City as a result of any failure of the WECS or TMT to comply with applicable laws, ordinances or regulations.

D. **Commercial WECS permitted.** Commercial WECS and TMT shall be considered a special land use in all zoning districts and shall subject to the provisions of this Section and Article 9. Applications for a commercial WECS or TMT shall require a complete special land use permit application in accordance with Section 15.510, including a complete site plan in accordance with Section 15.509.

E. **Standards and Requirements**. All On-site WECS, Commercial WECS and Temporary Meteorological Towers shall meet the following additional standards and requirements:

1. Setbacks.

   a. The distance between a WECS or TMT and the nearest property line shall be at least the 1 times the height of the WECS or TMT for all zoning districts. This shall include property lines that abut a public right-of-way.

   b. No part of the WECS or TMT structure, including guy wire anchors, may extend closer than ten (10) feet to the owner's property line.

   c. The distance between an On-site WECS and any other On-site or Commercial WECS shall be at least 0.5 times the height of the taller of the two On-site WECS. The distance between a Commercial WECS and any other Commercial WECS shall be at least 3 times the height of the taller of the two WECS.

2. Height.

   a. The height of on-site WECS and TMTs shall be as follows:

      1. In the following Districts, on-site WECS and TMTs shall not exceed 30 feet in height:

         a. R-A One-Family General Residential District
         b. RA-L One-Family Lakefront District
         c. R-B Two-Family Residential District
         d. RM-1 Multiple-Family Residential District (Low Rise)
         e. RM-2 Multiple-Family Residential District (High Rise)

      2. In the following Districts, on-site WECS and TMTs shall not exceed 40 feet in height:

         a. O-1 Office-Service District
         b. CR Commercial Recreation
         c. B-1 Local Business District
         d. B-2 Planned Community Business District
         e. B-3 General Business District
         f. CLD Central Lakefront Development District

g. P-1 Vehicular Parking District

3. In the following Districts, on-site WECS and TMTs shall not exceed 65 feet in height:

a. LI Light Industrial District
b. R-F Residential Facilities District

b. Commercial WECS and TMT shall not have a height limitation, provided all other requirements of this Section have been met.

c. Height shall be measured from the existing grade to the hub of the turbine blade for a horizontal axis turbine, and to the highest point of a vertical axis turbine.

d. Height for on-site WECS mounted to a structure shall be measured from grade to the hub of the turbine blade for a horizontal axis turbine, and to the highest point of a vertical axis turbine.

e. The applicant shall demonstrate compliance with all FAA regulations and the Michigan Tall Structures Act as part of the approval process, if applicable.

3. Noise; Sound Pressure Level.

a. Audible noise or the sound pressure level of an On-site WECS or Commercial WECS shall not exceed fifty-five (55) dB(A) (A-weighted Decibels) at the property line closest to the WECS. For Commercial WECS, modeling and analysis of sound pressure shall be required in accordance with Section 15.511.E.5.11.04.G.8 below.

b. This sound pressure level shall not be exceeded by more than five (5) dB(A) for more than three minutes in any hour of the day.

4. Lighting.

a. No WECS or TMT shall be artificially lighted, except any lighting required for structures regulated by Federal Aviation Administration requirements, the Michigan Airport Zoning Act (PA 23 of 1950), The Michigan Tall Structures Act (PA 259 of 1959), or any other applicable State or Federal laws or regulations.

5. Construction codes, towers, and interconnection standards.

a. Every WECS and TMT shall comply with all applicable State construction codes and local building permit requirements.

b. Every WECS and TMT shall comply with Federal Aviation Administration requirements, the Michigan Airport Zoning Act (PA 23 of 1950), The Michigan Tall Structures Act (PA 259 of 1959), and any other applicable State or Federal laws or regulations.

c. An On-site WECS or Commercial WECS that is tied to the electrical grid shall comply with Michigan Public Service Commission and utility interconnection requirements. Off-grid WECS are exempt from this requirement.

6. Safety.

a. Design Safety Certification. The safety of the design of every WECS or TMT shall be certified by the applicant's professional engineer registered in the State of Michigan and reviewed by the City. The standard for certification shall be included with the permit application. If WECS or TMT construction is approved, the professional engineer shall certify that the construction and installation of the WECS or TMT meets or exceeds the manufacturer's construction and installation standards, and any applicable State and Federal laws and regulations prior to operation.

b. Controls and Brakes. Every WECS or TMT shall be equipped with manual and automatic controls to limit rotation of blades to a speed not to exceed the designed limits of the WECS or TMT. The applicant's professional engineer must certify that the rotor and overspeed control design and fabrication conform to applicable design standards. No changes or alterations from certified design shall be permitted unless accompanied by a professional engineer's statement of certification approved by the City.

c. Lightning. Every Commercial WECS or TMT shall have lightning protection.

d. Guy Wires. If an On-site WECS or TMT is supported by guy wires, the wires shall be clearly visible to a height of a least six (6) feet above the guy wire anchors. Every Commercial WECS must be of a freestanding monopole design and guy wires shall not be used.

e. Grade Clearance. The minimum vertical blade tip clearance from grade shall be twenty (20) feet for any horizontal-axis WECS or from any moving component of a vertical-axis wind energy conversion system.

f. Electromagnetic Interference. No WECS or TMT shall be installed in any location where its proximity to existing fixed broadcast, retransmission, or reception antennae for radio, television, or wireless phone or other

personal communication systems or emergency broadcast systems would produce electromagnetic interference with signal transmission or reception unless the applicant provides a replacement signal to the affected party that will restore reception to at least the level present before operation of the wind energy system. No WECS or TMT shall be installed in any location within the line of sight of an existing microwave communications link where operation of the wind energy system is likely to produce electromagnetic interference in the link's operation unless the interference is insignificant.

g. Color. Towers and blades shall be painted a non-reflective neutral color designated on the application and approved by the City or as otherwise required by law.

h. Climb Prevention. Every WECS or TMT must be protected by anti-climbing devices twelve (12) feet from base of pole.

F. **Removal of Abandoned On-Site WECS or TMT.** In the event an On-Site WECS or TMT is abandoned or unused for a period of one hundred and eighty (180) days, or if a WECS or TMT is damaged, the owner of the tower or the land shall promptly remove the tower and all related equipment. Failure to remove the tower and related equipment in accordance with the foregoing shall subject the tower owner and land owner to fines established by the City Council. In addition, by accepting a permit for the On-Site WECS or TMT, the applicant and land owner agree that in the event the tower and equipment is not removed as required, after thirty (30) days notice from the City, the City may undertake such removal and bill the costs to the applicant and land owner plus an administrative fee of fifteen percent (15%) which if not paid within thirty (30) days shall be assessed against the land on which the tower and equipment is located and collected in the same manner as delinquent taxes.

G. **Additional Requirements for Commercial WECS.** The following standards and requirements shall apply to every Commercial WECS:

1. Warnings. A visible warning sign of High Voltage shall be placed at the base of every Commercial WECS. The sign must have at least six (6") inch letters with ¾-inch stroke. Such signs shall be located a maximum of three hundred (300) feet apart and at all points of site ingress and egress.

2. Signage. In addition to warning signs and signs required by law, every Commercial WECS shall be equipped with a sign containing owner identification and contact information. No other signs or advertising are permitted.

3. Liability Insurance. The owner or operator of a Commercial WECS shall maintain a current commercial liability and property damage insurance policy with coverage limits acceptable to the City pertaining to installation and operation of the Commercial WECS. The amount and terms of the policy shall be

established as a condition of conditional use permit approval. The City and land owner shall be named as additional insured. Certificates of insurance shall be provided to the City annually.

4. Security. The application shall include a description of security to be posted at the time of receiving a building permit for the WECS to ensure removal of the WECS when it has been abandoned or is no longer needed, as provided in subsection 10 below. The security shall be the form of: (i) cash; (ii) letter of credit; or, (iii) an escrow agreement, in an amount approved by the City engineer and in a form approved by the City Attorney providing for timely removal of the Commercial WECS as required under this Section, and payment of any costs and attorney fees incurred by the City in connection with such removal.

5. Visual Appearance; Powerlines. The design of the WECS buildings and related structures shall, to the extent reasonably possible, use materials, colors, textures, screening and landscaping that will blend WECS components with the natural setting and existing environment. The electrical collection system shall be placed underground within the interior of each parcel at a depth designed to accommodate any existing land use to the maximum extent practicable. The collection system may be place overhead adjacent to public roadways, at points of interconnection to the electric grid or in other areas as necessary.

6. Threatened and Endangered Species. The applicant shall submit an endangered and threatened species survey conducted by a qualified professional, such as an ecologist or zoologist, describing the potential impact of the WECS on any species listed as threatened or endangered by the federal government or the state of Michigan, including but not limited to migratory birds or bats. Permits shall not be issued unless the study determines that there shall be no negative effect on such species. Alternatively, the applicant may submit an endangered species permit from the State of Michigan to fulfill this requirement.

7. Annual Inspection; Maintenance. The WECS and surrounding area shall be maintained in accordance with industry standards including painting and landscaping. Every Commercial WECS must be inspected annually by an authorized factory representative or professional engineer to certify that the WECS is in good working condition and is not a hazard to persons or property. Certification records shall be submitted annually to the City.

8. Sound Pressure Level. As part of the application and prior to installation of any Commercial WECS, the applicant shall provide modeling and analysis to the City that will confirm that the Commercial WECS will not exceed the maximum permitted sound pressure levels. Modeling and analysis shall conform to IEC (International Electrotechnical Commission) 61400, which establishes structural and performance safety provisions for wind energy conversion systems, and ISO (International Organization for Standardization) 9613, which describes a method for calculating the attenuation of sound during propagation outdoors in order to

predict the levels of environmental noise at a distance from a variety of sources. After installation of the Commercial WECS, sound pressure level measurements shall be done by a third party, qualified professional according to the procedures in the most current version of ANSI S12.18, which provides an alternative method of measurement of sound pressure levels in the outdoor environment, considering the effects of the ground, the effects of refraction due to wind and temperature gradients, and the effects due to turbulence. All sound pressure levels shall be measured with a sound meter that meets or exceeds the most current version of ANSI S1.4 specifications for a Type II sound meter. Documentation of the sound pressure level measurements shall be provided to the local government within sixty (60) days of the operation of the project.

9. Shadow Flicker. The applicant shall conduct a four-season analysis of potential shadow flicker. The analysis shall identify the locations of shadow flicker that may be caused by the project and the expected durations of the flicker at these locations from sun-rise to sun-set over the course of a year. The analysis shall identify all areas where shadow flicker may affect occupants or users of the structures or properties. The analysis shall describe measures that will be taken to eliminate or mitigate adverse effects.

10. Removal. A Commercial WECS shall be removed by the owner of the WECS or land when the Commercial WECS has been abandoned or unused for one hundred and eighty (180) days ("Non-Use Period"). For purposes of this section, the damage, destruction or removal of any part of WECS equipment, or the cessation of operations shall be considered as the beginning of a Non-Use Period. The WECS owner or applicant shall notify the City of the beginning of any Non-Use Period or any removal of equipment. The end of the Non-Use Period may be sooner than one hundred eighty (180) days after commencement if the WECS or any portion of the facility becomes a nuisance or is dangerous to the public health, safety and welfare.

    a. At the end of the Non-Use Period, the owner of the WECS or the land shall immediately apply for and obtain any applicable demolition or removal permit, and shall immediately proceed with and complete the demolition and removal of the WECS and restoration of the land to the condition existing prior to installation, to the extent reasonably feasible.

    b. If the required demolition, removal and restoration of the WECS has not been lawfully completed within sixty (60) days after the end of the Non-Use Period, then after fifteen (15) days prior written notice to the land owner and the WECS owner, the City may remove or secure the removal of the WECS and related equipment and the City's costs, expenses, attorneys fees and consultants fees, plus a fifteen percent (15%) administrative charge may be drawn and collected from the security described in (4) above, and any costs and fees in excess of the amount of the security shall constitute a lien on the land on which the WECS is

located and may be collected in the same manner as delinquent taxes.

15.512 SOLAR STRUCTURES

A. **Permitted**. Active and passive solar energy devices, systems or structures shall be permitted in all zoning classifications by right, subject to administrative approval, except when such solar devices or architectural features project into required front or side yards, or are free-standing elements in a required front or side yard. When a proposed solar energy device is located within a required yard it shall be subject to the review and approval of the Planning Commission in accordance with the site plan review requirements of Section 15.509.

B. **Maximum Height of Structures**. Passive solar energy structures, such as flat plate collectors, photovoltaic cells, etc., which are roof-mounted or integrated otherwise into the roof structure shall not be included in the calculation of maximum height. Active solar energy structures, when mounted on either freestanding structural elements or integrated architecturally with a principal or accessory building shall not exceed a height of forty (40) feet.

C. **Lot Coverage.** Solar energy structures, regardless of type, when abutting the principal or any accessory structure, or freestanding, shall not be counted in the determination of maximum allowable lot coverage.

D. **Greenhouses**. Solar greenhouses and similar heat traps, when designed to be habitable spaces integrated into the primary structure, shall be included in the calculation of lot coverage at one-third (1/3) of their actual square foot area provided that not more than twenty (20) percent of their thermal mass, or transferring medium, is obscured from the radiant energy of the sun by other architectural elements. Such obscuration being calculated at a solar declination of twenty-two (22) degrees, due south.

15.513 SOLAR EASEMENTS

A. **Permitted**. A landowner may enter into an easement, covenant, condition or other property interest in any deed or other instrument, to protect the solar skyspace of an actual, proposed or designated solar energy structure at a described location by forbidding or limiting activities, land uses, structures and/or trees that interfere with access to solar energy. The solar skyspace must be described as the three (3) dimensional space in which obstruction is prohibited or limited. Any property owner may give or sell his right to access to sunlight. Such Solar Access Easements shall be recorded and copies shall be kept on file with the Macomb County Register of Deeds and the city of St. Clair Shores.

B. **Process**. A typical form of Solar Access Easement Agreement will be available in the St. Clair Shores Community Development Department, although alternate forms

accomplishing the same purpose may be acceptable. These Agreements shall be entered into by and between private parties. All Solar Access Easement Agreements are to be accompanied by a Plot Plan, prepared by a registered Civil Engineer or Land Surveyor, indicating all structures, trees or other vertical elements by type and height elevation.

STATE OF MICHIGAN

COUNTY OF OAKLAND

CITY OF NOVI

ORDINANCE NO. 18.240

AN ORDINANCE TO AMEND ORDINANCE NO. 97-18, AS AMENDED, THE CITY OF NOVI ZONING ORDINANCE, ARTICLE 25, GENERAL PROVISIONS. SECTION 2520, EXTERIOR BUILDING WALL FACADE MATERIALS AND SECTION 2503, ACCESSORY USES; IN ORDER TO PROVIDE STANDARDS FOR THE USE OF SOLAR COLLECTORS.

THE CITY OF NOVI ORDAINS:

Part I. That Ordinance No. 97-18, the City of Novi Zoning Ordinance, as amended, Article 25, General Provisions, Section 2520, Exterior Building Wall Façade Materials and Section 2503, Accessory Uses are hereby amended to read as follows:

Article 25, General Provisions

Sec. 2520. Exterior Building Wall Façade Materials.

1. – 13. [unchanged]

14. *Sustainability in design.* Promoting sustainability in design is encouraged at the applicant's discretion and façade materials that meet the intent of the LEED (Leadership in Energy and Environmental Design) standards may be utilized. The proposed façade composition must still meet the aesthetic standards set forth by this ordinance and undefined materials will be considered on a case by case basis. Solar structures shall be a permitted use in all districts and not subject to the requirements of Section 2520.

Sec. 2503. Accessory Uses.

1. [unchanged]

2. *Accessory Structures.*

A. – F. [unchanged.]

G. Solar collectors shall be defined as a device or combination of devices, structures, or parts thereof, that collect, transfer or transform director solar, radiant energy into thermal,

chemical or electrical energy and that contribute significantly to a structure's energy supply.

(1) Freestanding solar collectors shall be defined as solar collectors not attached to and separate from any existing structures on the site. Freestanding solar collectors shall be considered an accessory building and shall be subject to the requirements for such, together with all other applicable building codes and ordinances.

(2) Structurally attached solar collectors shall be defined as solar collectors attached to an existing structure's roof or wall or serving as a structures roof, wall, window or other structural member. Structurally attached solar collectors shall be a permitted accessory use in all districts and subject to administrative review and approval. Structurally attached solar collectors shall not be subject to the provisions of Section 2503.2.A and shall not be included in the height requirements listed in Section 2400. Structurally attached solar collectors installed on a building with a sloped roof shall not project vertically above the peak of the roof. Structurally attached solar collectors installed on a building with a flat roof shall not project vertically more than 5 feet above the roof.

PART II.

Severability. Should any section, subdivision, clause, or phrase of this Ordinance be declared by the courts to be invalid, the validity of the Ordinance as a whole, or in part, shall not be affected other than the part invalidated.

PART III.

Savings Clause. The amendment of the Novi Code of Ordinances set forth in this Ordinance does not affect or impair any act done, offense committed, or right accruing, accrued, or acquired or liability, penalty, forfeiture or punishment, pending or incurred prior to the amendment of the Novi Code of Ordinances set forth in this Ordinance.

PART IV.

Repealer. All other Ordinance or parts of Ordinance in conflict herewith are hereby repealed only to the extent necessary to give this Ordinance full force and effect.

PART V.

Effective Date: Publication. Public hearing having been held hereon pursuant to the provisions of Section 103 of Act 110 of the Public Acts of 2006, as amended, the provisions of this Ordinance shall be published within fifteen (15) days of its adoption by publication of a brief notice in a newspaper circulated in the City of Novi stating the date of enactment and effective date, a brief statement as to its regulatory effect and that a complete copy of the Ordinance is available for public purchase; use and inspection at the office of the City Clerk during the hours of 8:00 A.M. to 5:00 P.M., Local Time. The provisions of this Ordinance shall become effective seven (7) days after its publication.

Made, Passed and Adopted by the Novi City Council this 3rd day of May, 2010.

David B. Landry, Mayor

Maryanne Cornelius, City Clerk

Certificate of Adoption

I hereby certify that the foregoing is a true and complete copy of the ordinance adopted at the regular meeting of the Novi City Council held on the 3rd day of May, 2010.

Maryanne Cornelius, City Clerk

Adopted: 05/03/2010
Published: 05/13/2010
Effective: 05/10/2010

CERTIFICATE OF CLERK

I hereby certify that the foregoing ordinance was published by posting a copy at the following time and place within the City of Novi, on the 4th day of May, 2010.

1. Novi City Hall 45175 W. Ten Mile Road

I do further certify that on the 13th day of May, 2010 said Zoning Text Amendment 18.240 was published in brief in the Novi News, a newspaper published and circulated in said City.

Maryanne Cornelius

Maryanne Cornelius, City Clerk

Essential Services Standards (ES)

4.09 ES-01

This Essential Services Standards section applies to the following districts:

PP R1A R1 R2 R3 R4 R5 R6 R7 R8 O1 O2 P B1 B2 B2B B2C B3 I1 I2

The following essential services standard applies:

A. Essential Services: Essential services shall be permitted as authorized and regulated by law and other ordinances of the city and are exempt from the application of the Zoning Ordinance.

B. Roof-Mounted Solar Electric Systems:

1. Roof-mounted solar panels are permitted on buildings and structures in all zoning districts and may include integrated solar panels as the surface layer of the roof structure with no additional apparent change in relief or projection, or separate flush mounted solar panels attached to the roof;
2. Separate, non-integrated flush-mounted solar panels shall be located on a rear- or side-facing roof, which do not front any street, unless such installation is proven to be ineffective or impractical. If installation is not practical on a rear- or side-facing roof, any other placement in all zoning districts shall be subject to a Design Review by either the Planning Board (non-historic properties) or the Historic District Commission (historic properties);
3. Separate flush-mounted solar panels installed on a building or structure with a sloped roof surface shall not project vertically above the peak of the roof to which it is attached, or project vertically more than five (5) feet above a flat roof installation; and
4. No solar panels shall ever project higher than the permitted building height in any zoning district.

42-4.35 FULLY ENCLOSED INDUSTRIAL OPERATIONS

Such uses involving the manufacturing, processing, assembling or packaging of finished or semi-finished products from previously prepared material are subject to the following conditions:

1. Industrial developments shall be permitted only as part of a "planned industrial park," consisting of at least fifteen (15) acres and being platted and developed in at least five (5) individual sites having an internal service road system with the following setback considered as minimum:

Yard	Minimum Setback (in feet)
Front or Side yard (abutting internal street or major thoroughfare)	40 (See Section 3.6.2.K)
Side Yard (internal between buildings)	Equal to building height (See Section 3.6.2.K)
Rear Yard (external abutting residence)	50 (See Section 3.6.2.L)

2. The industrial operation shall not include any stamping or grinding in the preparation of the product unless it is incidental to the primary use.
3. The processing of material for shipment in bulk form, to be used in an industrial operation at another location, shall not be permitted.
4. Open storage shall not be permitted.
5. A twenty (20) foot greenbelt shall be provided on those sides of the property abutting land zoned for residential use and shall be set aside as a dedicated easement for greenbelt purposes. The greenbelt shall be reviewed and approved by the Planning Commission in conformity with the requirements of Section 42-5.6.
6. Accessory structures and uses customarily incidental to the above permitted uses may be permitted.

42-4.36 WAREHOUSING, MANUFACTURING, COMPOUNDING, AND REPAIR USES

Such uses are subject to the following:

1. Uses shall be conducted wholly within a completely enclosed building, or within a designated area enclosed on all sides with a six (6) foot fence or solid wall. Said wall or fence shall be completely obscuring on those sides where abutting or adjacent to districts zoned for residential, business or research park uses.
2. For auto repair centers, all motor vehicles repaired and waiting to be repaired shall be stored in a building or obscured from view with a six (6) foot obscuring masonry wall. The open storage of junk or auto parts shall be prohibited.

42-4.37 WIND ENERGY SYSTEMS[m]

1. In the R-1, R-2 and R-3 Districts, such uses are subject to the following:
   A. One residential wind energy system shall be permitted for the primary purpose of serving the residential lot.
   B. The commercial sale of surplus energy is prohibited.
   C. The minimum site area for a residential wind energy system shall be five (5) acres.
   D. The maximum residential wind energy system shall be the minimum height necessary or reasonable to serve its intended function or no more than one hundred (100) feet, whichever is less.
   E. A residential wind energy system shall be set back from any property line a minimum distance equal of six (6) times the height of the wind energy system.
   F. A residential wind energy system shall comply with all of the conditions as set forth in Section 42-4.37.2 as applicable, unless otherwise noted in this Section.
2. In the ML District, such uses are subject to the following:
   A. There shall be a limitation of one (1) residential wind energy system, intended to primarily serve the needs of the site, unless otherwise provided.
   B. Sufficient wind resources. The proposed site shall have documented annual wind resources sufficient for the operation of the proposed wind energy system provided, however, this standard shall not apply to an anemometer tower. No wind energy system shall be approved without submission of a wind resource study documenting wind resources on the site over a minimum of one (1) year. Said study

shall indicate the long-term commercial economic viability of the project. The commercial sale of surplus energy is prohibited. The Township may retain the services of an independent, recognized expert to review the results of the wind resource study prior to acting on the application for a special use permit.

C. Minimum site area. The minimum site area for a wind energy system shall be a minimum of five (5) acres, subject to meeting the required setbacks and any other applicable standards of this Section.

D. Setbacks. Each proposed wind energy system shall meet the following applicable setback requirements:

i. Each wind energy system shall, in all cases, be set back from property lines, public or private road right-of-way, or easement, a minimum distance of six (6) times the height of the wind energy system, or greater if data provided by the applicant and prepared by a qualified professional demonstrates any potential blade and ice throw may cross the property line. The data shall also demonstrate sound levels will not exceed sixty five (65) decibels on the dB(A) scale at the property line from the proposed setback. Data provided shall be specific to the proposed tower in the proposed location taking into consideration prevailing winds, topography, existing vegetation, and other relevant factors.

ii. Adjacent wind energy system locations must be spaced at least one-half (½) mile apart.

E. Maximum height.

i. The maximum wind energy system height shall be one hundred fifty (150) feet.

ii. The Planning Commission may approve an increased height for a wind energy system, not to exceed two hundred (200) feet, if the increased height will result in the preservation of a substantial stand of trees, existing land forms or structures that would otherwise be removed to increase wind velocity.

iii. The increased height will not result in increased intensity of lighting on the tower due to FAA (Federal Aviation Association) requirements.

F. Minimum rotor wind vane or blade clearance. The lowest point of the arc created by a rotating wind vane or blade on a wind energy system shall be no less than twenty (20) feet. The Planning Commission may require additional clearance if potential safety concerns are identified.

G. Maximum noise levels. Any proposed wind energy system shall produce sound levels that are no more than sixty five (65) decibels as measured on the dB(A) scale at the property lines of the site in question. A noise report shall be submitted with any application for a wind energy system. A noise report shall be prepared by a qualified professional and shall include the following, at a minimum:

i. A description and map of the project's noise producing features, including the range of noise levels expected, and the basis of the expectation.

ii. A description and map of the noise sensitive environment, including any sensitive noise receptors, i.e. residences, hospitals, elder care developments, libraries, schools, places of worship, parks, areas with outdoor workers and other facilities where quiet is important or where noise could be a nuisance within two (2) miles of the proposed facility.

iii. A survey and report prepared by a qualified engineer that analyzes the preexisting ambient noise (including seasonal variation) and the affected sensitive receptors located within two (2) miles of the proposed project site. Potential sensitive receptors at relatively less windy or quieter locations than the project shall be emphasized and any problem areas identified.

iv. A description and map of the cumulative noise impacts with any problem areas identified.

v. A description of the project's proposed noise control features and specific measures proposed to mitigate noise impacts for sensitive receptors as identified above to a level of insignificance.

H. Maximum vibrations. Any proposed wind energy system shall not produce vibrations humanly perceptible beyond the property on which it is located.

I. Transmission lines. The on-site electrical transmission lines connecting the wind energy system to the public utility electricity distribution system shall be located underground.

J. Interference with residential reception. Any wind energy systems shall be constructed and operated so that they do not interfere with television, microwave, navigational or radio reception to neighboring areas.

K. Landscaping. Each proposed wind energy system shall meet the following landscaping requirements; provided, however, the Planning Commission may reduce such requirements if it finds that because of the remote location of the site, or other factors, the visual impact of the wind energy system would be minimal.

   i. For any wind energy system, a landscaping strip shall be provided along the property perimeters adjacent to roadways. Such landscaping shall be designed to obscure year-round the view of the wind energy system from the roadway. Where deemed appropriate by the Planning Commission, additional landscaping along the property perimeter shall be provided to screen the wind energy system from existing or future residential land uses. Existing natural vegetation may fulfill this requirement in whole or in part upon Planning Commission approval.

   ii. Existing natural land forms on the site which effectively screen the wind energy system from adjacent residential property used for residential purposes shall be preserved to the maximum extent possible.

   iii. To ensure compliance with these landscaping standards, the Planning Commission may require additional landscaping on the site after the installation of the wind energy system.

L. State or federal requirements. Any proposed wind energy system shall meet or exceed any standards and regulations of the FAA (Federal Aviation Association), the Michigan Public Service Commission, National Electric Safety Code, and any other agency of the state or federal government with the authority to regulate a wind energy system or other tall structures in effect at the time the special use permit is approved.

M. Soil conditions. A proposal for any wind energy system shall be accompanied by a report of the soils present on the site based on soil boring, and a description of the proposed foundation size, materials, and depth. Such foundation shall be installed below plow depth to allow for feasible future reuse of the land unless the applicant provides a financial assurance that the foundation will be removed in the event that the tower is removed. Stormwater runoff and soil erosion measures shall be installed in conformance with the Township Code.

N. Aesthetics and lighting. Any proposed wind energy system shall meet the following requirements:

   i. Each wind energy system shall either maintain a galvanized steel finish or, subject to any applicable standards of the FAA, be painted a neutral color so as to reduce visual obtrusiveness.

   ii. Each wind energy system, including turbine generator and all accessory structures, shall, to the extent possible, use materials and colors that will blend them into the natural setting and surrounding buildings. A medium gray shade is the preferred color for any wind energy system; however, the Planning Commission may approve an alternate color if the facility is suspected to be located within an avian migratory route or if an alternate color would otherwise benefit the community.

   iii. Each wind energy system shall not be artificially lighted, unless required by the FAA or other applicable governmental authority. If lighting is required, the lighting alternatives and design chosen:

      a. Shall be the lowest intensity allowable under FAA regulations.

      b. Shall not be strobe lighting or other intermittent white lighting fixtures, unless expressly required

by the FAA. Such intermittent lighting shall be alternated with steady red lights at night if acceptable to the FAA.

c. May be a red top light that does not pulsate or blink. All tower lighting required by the FAA shall be shielded to the extent possible and acceptable to the FAA to reduce glare and visibility from the ground.

d. Where acceptable to the FAA, the Township will approve white lights over red lights, and steady lights over strobed or intermittent lights.

e. Each wind energy system shall be sited on the property in a location that reduces to the maximum extent possible any adverse impacts on significant view corridors from adjacent properties, while at the same time maintaining contact with economically viable wind resources. A visual simulation model is required to assess the visual impacts. Each wind energy system shall be a monopole or monotube-style construction (as distinguished from a lattice-style tower) and shall not utilize guy wires.

iv. The Planning Commission may require design changes in order to lessen the visual clutter associated with the siting of a wind energy system.

O. Sign. A sign no more than four (4) square feet in area displaying an address and telephone number for emergency calls and informational inquiries shall be posted at the wind energy system erected prior to a wind turbine generator. The emergency telephone number shall allow a caller to contact a responsible individual to address emergencies at any time during or after regular business hours, on weekends or holidays. No wind energy systems or site shall include any advertising sign.

P. Shadow flicker. The applicant shall provide a shadow flicker model for any proposed wind energy systems. The model shall:

i. Map and describe within a one (1) mile radius of the proposed project site the topography, existing residences and location of their windows, locations of other structures, wind speeds and directions, existing vegetation and roadways. The model shall represent the most probable scenarios of wind constancy, sunshine constancy, and wind directions and speeds.

ii. Calculate the locations of shadow flicker caused by the proposed project and the expected durations of the flicker at these locations, calculate the total number of hours per year of flicker at all locations.

iii. Identify problem areas where shadow flicker will interfere with existing or future residences and roadways and describe proposed measures to mitigate these problems, including, but not limited to, a change in siting of the facility, a change in the operation of the facility, or grading or landscaping mitigation measures.

iv. The facility shall be designed such that shadow flicker will not fall on, or in, any existing dwelling. Shadow flicker expected to fall on a roadway or a portion of a residential parcel may be acceptable under the following circumstances:

a. The flicker will not exceed thirty (30) hours per year; and the flicker will fall more than one hundred (100) feet from an existing residence.

b. The traffic volumes are less than five hundred (500) vehicles per day on the roadway.

Q. Hazard planning. An application for a wind energy system shall be accompanied by a hazard prevention plan. Such plan shall address the following at a minimum:

i. Certification that the electrical wiring between the wind energy system and the utility right-of-way does not pose a fire hazard.

ii. The landscape plan accompanying the application shall be designed to avoid spread of fire from any source on the wind energy system; such preventative measures may address the types and location of vegetation below the wind energy system and on the site.

iii. The following shall be submitted with the application for a special use permit for a wind energy system:

a. A listing of any hazardous fluids that may be used on site shall be provided.

b. Certification that the turbine has been designed to contain any hazardous fluids shall be provided. A statement certifying that the turbine shall be routinely inspected to ensure that no fluids are released from the turbine.

c. A hazardous materials waste plan shall be provided.

R. Removal of abandoned or unsafe wind energy system. Any wind energy system that is not operated for a continuous period of twelve (12) months shall be considered abandoned. Any tower found to be unsafe or not in compliance with the special land use conditions related to noise or shadow flicker placed upon it by the Planning Commission, shall be found to be in violation of the special land use permit. The owner of any wind energy system that is abandoned or in violation of the special land use permit shall remove the same within ninety (90) days of receipt of notice from the Township of such abandonment or violation. In addition to removing the wind energy system, the owner shall restore the site of the wind energy system to its original condition prior to location of the wind energy system, subject to reasonable wear and tear. Any foundation associated with a wind energy system shall be removed to a minimum depth of five (5) feet below the final grade and site vegetation shall be restored. Failure to remove an abandoned wind energy system within the ninety (90) day period provided in this subsection shall be grounds for the Township to remove the wind energy system at the owner's expense. Any expenses incurred by the Township including costs and reasonable attorneys' fees shall be reimbursed at the owner's expense. The Planning Commission shall require the applicant to file a bond equal to the reasonable cost of removing the wind energy system and attendant accessory structures as a condition of a special use permit given pursuant to this Section.

S. New technology. These regulations pertaining to wind energy systems are intended to respond to equipment available at the time of adoption. The Township recognizes that this is an emerging technology and that new means of collecting wind energy are under development. The Township, therefore, reserves the right to withhold approval on any wind energy system utilizing technology and equipment not widely in use as of October 8, 2007, and not addressed in this Section, pending appropriate study and, if necessary, alteration of these regulations pursuant to Section 42-7.6.

42-4.38 SPECIAL ACCOMMODATIONS USES

1. Purpose. This Section is intended to authorize the grant of relief from the strict terms of this Chapter in order to provide equal housing opportunities particularly suited to the needs of persons entitled to reasonable accommodation under law and to encourage innovation in land use and variety in design and layout. In the event state or federal law, e.g., The Federal Fair Housing Amendments Act of 1988, requires the Township to make "reasonable accommodation" for a particular proposed user of property, the Township Board, following public hearing before and recommendation of the Township Supervisor, under the authority of MCL 125.3502, may administratively approve a special accommodation use, subject to and in accordance with this Section.

2. Applicant to comply with terms and conditions. As a condition to approval of a special accommodation use, the applicant must comply with all of the terms of this Section, and must demonstrate all of the following:

A. The ultimate residential user or users of the property shall be persons for whom state or federal law mandates the Township to make reasonable accommodations in connection with proposed uses of land; and

B. Taking into consideration the needs, facts, and circumstances which exist throughout the community, and within the population to be served by the use, including financial and other conditions, making the proposed reasonable accommodation shall be necessary to afford such persons equal opportunity to the proposed use and enjoyment within the community; and

3. Accessory buildings located on double frontage (through) lots shall observe front yard setback requirements on both streets.

C. **Energy Uses**

1. **Wind Energy Conversion Systems (WECS).** WECS designed to service the energy needs of the property where the structure is located shall be allowed as an accessory structure in all districts, subject to the following requirements:

   (a) Only one (1) WECS shall be permitted per lot.
   (b) The height of the overall WECS with the blade in the vertical position shall not exceed eighty (80) feet above ground level.
   (c) All towers shall be set back a distance at least equal to the height of the overall WECS from all lot lines. The height shall be measured to the top of the blade at its highest point.
   (d) Blade arcs created by a WECS shall not interfere with any structure, utilities or vegetation. The minimum blade or rotor clearance above ground level shall be at least twenty (20) feet.
   (e) All towers used to support the wind generating equipment shall be adequately anchored.
   (f) The WECS shall be equipped with both a manual and automatic braking device capable of stopping the WECS operation in high winds within eighty percent (80%) of design limits of the rotor.
   (g) Noise emissions from the operation of a WECS shall not exceed forty-five (45) decibels on the DBA scale as measured at the nearest lot line or road.
   (h) To prevent unauthorized climbing, the WECS must include an anti-climb device.
   (i) Any WECS not used for one (1) year or longer shall be deemed to be abandoned and shall be promptly dismantled and removed from the property by the owner of the WECS.

2. **Solar Energy Systems.** Solar energy systems designed to service the energy needs of the property where the structure is located shall be allowed as an accessory structure in all districts, subject to the following requirements:

   (a) Solar energy systems shall meet the requirements of this Section and all other applicable construction codes.
   (b) The design of the solar energy system shall conform to applicable industry standards.
   (c) Solar energy systems shall be screened per the discretion of the Community Development Department.
   (d) Solar energy systems shall meet height and setback requirements of the zoning district in which they are located.
   (e) Solar energy systems shall be securely anchored to the ground or a permanent structure.
   (f) A ground-mounted solar energy system shall comply with the accessory structure restrictions contained in the zoning district where it is located.
   (g) All exterior electrical and/or plumbing lines must be buried below the surface of the ground in compliance with current code.
   (h) Any solar energy system not used for one (1) year or longer shall be deemed to

be abandoned and shall be promptly dismantled and removed from the property by the owner of the solar energy system.

(i) Waiver. Upon request, the Planning Commission may grant waivers of the setback or height requirements, provided that the waiver will not present any undue hardships on adjoining properties. The Planning Commission shall take into consideration the support or opposition of adjacent property owners in granting waivers of setback or height requirements.

D. **Outdoor Display, Sales and Storage.** Outdoor display, sales, or storage accessory to an approved principal use may be approved by the Planning Commission if deemed compatible with surrounding land uses and found to be compatible with the character of the area in accordance with the following:

1. **In General**

(a) Goods and materials shall not be piled or stacked higher than the height of the screening wall. Vehicles, truck trailers, implements, and recreational vehicles may exceed the height of the screening wall provided that they are set back from the screening wall a distance equal to their height.

(b) The outdoor display, sales and storage of fertilizers, pesticides, and other hazardous materials is prohibited.

(c) Soil, sand, mulch, and similar loosely packaged materials shall be contained and covered to prevent it from blowing into adjacent properties.

(d) All areas shall be paved with a permanent, durable, and dustless surface and shall be graded and drained to dispose of all surface water.

(e) The applicant shall demonstrate there will be adequate parking for the existing uses as well as the proposed outdoor sales, display or storage.

(f) The location shall not interfere with public passage or the otherwise normal flow of pedestrian or vehicular traffic.

(g) Lighting for security purposes may be required as determined by the Planning Commission.

(h) Temporary uses that occur for less than two (2) weeks in any calendar year are exempt from these regulations.

2. **Display or Sales**

(a) Outdoor display or sales is permitted in all Mixed-Use, Commercial, and Office Districts.

(b) Outdoor display or sales areas may occupy up to fifteen percent (15%) of each front, side, and rear yard respectively, provided all setbacks are met.

(c) Outdoor display or sales areas shall be screened from view by a masonry wall where the display area abuts a Residential District

3. **Storage**

(a) Outdoor storage is permitted in all Industrial Districts.

(b) Screening of outdoor storage areas shall consist of any combination of fences, walls, berms and landscaping that are at least eight (8) feet in height that in the

1265.11 ACCESSORY USES.

(a) Accessory Buildings. Accessory buildings, except as otherwise permitted in this Zoning Code, shall be subject to the following regulations:

(1) Where the accessory building is structurally attached to a main building, it shall be subject to, and must conform to, all regulations of this Zoning Code applicable to the main building.

(2) Accessory buildings shall not be erected in any minimum side yard setback nor in any front yard.

(3) In the single and two family districts one or more accessory buildings shall be permitted per residential lot. No accessory building or combination of accessory buildings on a lot shall occupy more than 25 percent of the rear yard of a single family residential lot, or contain more than 900 square feet in total floor area, whichever limitation is the more restrictive.

(4) No detached accessory building shall be located closer than ten feet to any main building unless it is attached thereto, nor shall it be located closer than three feet to any side or rear lot line, except as otherwise provided for in the individual use districts. In those instances where the rear lot line is coterminous with an alley right of way, the accessory building shall not be closer than one foot to such rear lot line. In no instance shall an accessory building be located within a dedicated easement or right of way.

(5) No detached accessory building in the R-1, R-2, R-T, RM-1 and RM-2 Districts shall exceed 15 feet in height, measured form the ground at the base of the building to the ridge line of the roof. Accessory buildings in all other districts may be constructed to equal the permitted maximum height of structures in such districts.

(6) On corner lots, detached garages shall be placed two feet from the lot line opposite the side street line or, on lots exceeding 40 feet in width, the entrance to the garage shall be not less than 18 feet from the side street line. Garages attached to and made structurally a part of the principal building shall not extend beyond the side of the building on the side street line.

(7) An accessory garage may be constructed prior to a principal use building when necessary for construction purposes, subject to the review and approval of the Board of Zoning Appeals.

(b) Accessory Structures. Accessory structures except where otherwise permitted and regulated in this Zoning Code shall be subject to the following regulations:

(1) Except where otherwise permitted in this section, accessory structures shall be located in the rear yard and shall meet the setback requirements of an accessory building.

(2) Flag poles may be located within any required front or exterior side yard. Such poles shall be located no closer to a public right-of-way than one-half the distance between the right-of-way and the principal building.

(3) Canopy or canopies covering gasoline pump islands may extend into the required front or

exterior side yards to a point ten feet from the street right-of-way line.

(4) Ground mounted private communication antennas shall be located in the rear yard, except when it can be found such antennas will not be highly visible from a street, they may be located in a non-required interior side yard. No private communications antenna, including extendable antennas, shall exceed the height limitations of the district in which it is located when fully extended and shall be placed so that a horizontal distance at least equal to the vertical height of the antenna shall be provided between the base of the antenna and the nearest property line. Except, in those instances where an antenna extending upward from the ground is also securely attached elsewhere to a building, the required distance to the nearest property line may be measured from the building attachment to the top of the antenna. All such antenna may be attached to a pole, a tower or to a rooftop of a principal or accessory building, provided all applicable structural and electrical code requirements are met. Dish antennas located on the ground shall observe all setbacks pertaining to an accessory building. Wiring between a ground mounted antenna and a receiver shall be placed at least eight inches beneath the ground within conduit. In residential districts, no roof, pole or tower mounted antenna shall exceed a dimension of 8 feet by 8 feet or a diameter of 8 feet and shall not project more than 8 feet above the roof on which it is located, or above the maximum height limitations of the district, whichever is less. Ground mounted antenna shall not exceed a dimension of 12 feet by 12 feet or a diameter or 12 feet. In nonresidential districts, no roof, pole or tower mounted antenna shall exceed a dimension of 12 feet by 12 feet or, a diameter of 12 feet. Ground mounted antenna shall not exceed a dimension of 16 feet by 16 feet, or a diameter of 16 feet.

(5) Wind powered generators shall be permitted provided:

A. They are located in the rear yard only;

B. They do not exceed the height limitation of the district;

C. They are so located on the premises that a distance at least equal to the height of the generator blades at their apogee is provided to the nearest property line; and

D. They meet all applicable structural and electrical codes.

(6) Solar energy panels when located on the ground shall observe all applicable electrical codes and all applicable requirements pertaining to an accessory building. When roof mounted they shall be mounted either flat against the roof surface or, shall not project more than four feet outward from the roof measured from the surface of the roof where so affixed, to the farthest outward projection of the panel.

(Ord. 913. Passed 7-3-01; Ord. 926. Passed 5-6-03.)

ORDINANCE NO. 09-10-01

DUNDEE TOWNSHIP
ZONING ORDINANCE AMENDMENT

THE TOWNSHIP OF DUNDEE ORDAINS:

Section 1: Article V, General Provisions, is amended to add the following new Section 5.44 regulating solar panels, to read as follows:

SECTION 5.44 SOLAR PANELS

Solar panels shall be allowed in all zoning districts either attached to permitted principal or accessory buildings or as accessory structures subject to the following regulations:

1. **Attached to building.** Where attached to a building, the solar panels shall be subject to the same regulations as the building in terms of height and setbacks. Solar panels may be attached to the roof or the building wall, but not both.

   a. Roof mounted panels shall include solar panels integrated as the surface layer of the roof structure with no additional apparent change in relief or projection (the preferred installation), or separate flush-mounted solar panels attached to the roof surface.

      (1) Solar panels integrated as the surface layer of the roof structure may be located on any part of the roof.

      (2) Separate flush-mounted solar panels may only be located on a rear- or side-facing roof.

      (3) Separate flush-mounted solar panels installed on a building or structure with a sloped roof surface shall not project vertically above the peak of the roof to which it is attached.

      (4) Solar panels mounted on a flat roof shall not project vertically higher than the height of the parapet wall surrounding the roof or shall be screened by architectural features in accordance with Section 11.6.2.

   b. Flush-mounted solar panels on the building wall may only be attached to one (1) side or rear building façade and shall not face a street.

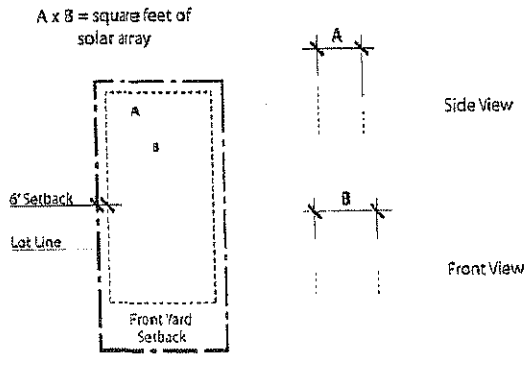
2. **Free-standing.** Solar panels that are not attached to a building shall be permitted as accessory structures subject to the following regulations:

   a. Free-standing solar panels shall be permitted in the rear yard only.

   b. Free-standing solar panels shall be setback six (6) feet from the side and rear lot line.

   c. Free-standing solar panels shall not exceed a height of four (4) feet.

   d. The surface area covered by a free-standing system shall not exceed two percent (2%) of



the lot or three hundred sixty (360) square feet, whichever is less. Area covered shall be included in the lot coverage calculations for the lot.

e. All power transmission lines shall be underground.

f. Free-standing solar panels shall not be visible from adjacent property and shall be screened by landscaping where necessary.

3. **Glare.** Solar panels shall be placed and arranged such that reflected solar radiation or glare shall not be directed onto adjacent buildings, properties or roadways.

4. **Building permit.** Solar energy systems shall conform to applicable industry standards. A building permit shall be obtained for a solar energy system in accordance with the Building and Electrical Codes.

Section 2. SEVERABILITY

If any provision of this Ordinance is found to be invalid, the remaining portions of this Ordinance shall remain enforceable.

Section 3. EFFECTIVE DATE

This Ordinance shall take effect seven (7) days following the date of its publication.

On the question: "SHALL THIS ORDINANCE NOW PASS?" the following vote was recorded:

Yeas:

Nays:

I hereby approve the adoption of the foregoing Ordinance this _____ day of _____, 2010.

_____
Tira J. O'Lone
Township Clerk

_____
Joanna C Uhl
Township Supervisor

(5) Covered and enclosed structures intended for use residential year-round (e.g. sunroom, screened porches, enclosed gazebos) are also subject to the building setback applicable to the principal structure and in the applicable zoning district.

(d) **Second Story Decks**

(1) Second story decks, including any walkway or stairwell connecting the second story deck to a first story deck, a ground-level deck, or a deck located above a walk-out basement, may extend into the rear yard setback, provided it does not extend more than fourteen (14) feet from the rear of the dwelling.
(2) The area of a second story deck shall not count toward the permitted lot coverage for accessory buildings and structures.
(3) If covered or enclosed, a second-story deck is subject to the minimum setbacks that apply to the principal structure on the property, as set out the applicable zoning district.

Section 13.06 Solar Panels

Freestanding solar panels (i.e. not attached to the principal building) shall be considered an accessory building and shall be subject to the requirements for such, together with all other applicable building codes and ordinances.

Section 13.07 Swimming Pools and Hot Tubs

(a) **Location**

(1) Swimming pools, spas, hot tubs and similar devices shall not be located in any front yard.
(2) Swimming pools, spas, hot tubs and similar devices shall not be located in any easement.
(3) A minimum distance of six (6) feet shall be maintained between any swimming pool and property line and/or any accessory structure.
(4) Swimming pools shall be setback in accordance with *Table 13.07*.
(5) Spas, hot tubs and similar facilities shall be setback at least ten (10) feet from the rear lot line and meet the side yard setback of the applicable zoning district.

Table 13.07
Swimming Pool Setbacks

Feature	Minimum Setback
1. Rear Lot Line	6 ft.
2. Interior Side Lot Line	6 ft.
3. Corner Side Lot Line	Front yard setback of applicable zoning district
4. Principal Building Wall	10 ft.
5. Easement	1 ft.
6. Private Well	25 ft.
7. Sewer	3 ft.
8. Septic Tank	10 ft.

(b) **Security Fencing.** Swimming pools, spas, hot tubs and similar devices that contain twenty-four (24) inches or more of water in depth at any point shall meet the security requirements of the Building Code.

7(12)

MONROE COUNTY, PENNSYLVANIA
MODEL ORDINANCE FOR
ON-SITE USAGE OF SOLAR ENERGY SYSTEMS

Township/Borough of [*Municipality name*]
Monroe County, Pennsylvania

ORDINANCE NO. --------

AN ORDINANCE TO AMEND THE ZONING ORDINANCE OF [*MUNICIPALITY NAME*], BY AMENDING [*ARTICLE/SECTION*], DEFINITIONS, BY ADDING DEFINTIONS FOR SOLAR ENERGY SYSTEMS AND BY AMENDING [*ARTICLE/SECTION*], ADDING A NEW SECTION TO PERMIT SOLAR ENERGY SYSTEMS AS AN ACCESSORY TO PERMITTED, CONDITIONAL AND SPECIAL EXCEPTION USES IN ANY ZONING DISTRICT.

BE IT HEREBY ENACTED AND ORDAINED by the [*Governing Body*] of [*Municipality name*], Monroe County, Pennsylvania, that the [*Municipal*] Zoning Ordinance, shall be amended in the following respects:

Section 1. The Zoning Ordinance of [*Municipality name*] [*Section/Article*], Definitions, shall be amended to include the following definitions:

Mechanical Equipment: Any device associated with a solar energy system, such as an outdoor electrical unit/control box, that transfers the energy from the solar energy system to the intended on-site structure.

Solar Access: A property owner's right to have sunlight shine on the owner's land. (*The enforcement of this right is through the zoning ordinance that establishes height and setback requirements.*)

Solar Energy System: An energy conversion system, including appurtenances, which converts solar energy to a usable form of energy to meet all or part of the energy requirements of the on-site user. This definition shall include the terms passive solar and active solar systems.

Solar Glare: The effect produced by light reflecting from a solar panel with an intensity sufficient to cause annoyance, discomfort, or loss in visual performance and visibility.

Section 2. Applicability:

1. This ordinance applies to solar energy systems to be installed and constructed after the effective date of the ordinance.

2. Solar energy systems constructed prior to the effective date of this ordinance shall not be required to meet the requirements of this ordinance.

3. Any upgrade, modification, or structural change that materially alters the size or placement of an existing solar energy system shall comply with the provisions of [*Section/Article*].

Section 3. The Zoning Ordinance of [*Municipality name*], [*Section/Article*], Accessory Regulations, shall be amended by adding [*Section/Article#*] as follows:

SOLAR ENERGY SYSTEMS

It is the purpose of this regulation to promote the safe, effective and efficient use of solar energy systems installed to reduce the on-site consumption of utility supplied energy and/or hot water as a permitted accessory use while protecting the health, safety and welfare of adjacent and surrounding land uses through appropriate zoning and land use controls. A solar energy system shall be permitted in any zoning district as an accessory to a principal use herein and subject to specific criteria as set forth below. Where said general standards and specific criteria overlap, the specific criteria shall supersede the general standards.

1. The installation and construction of a solar energy system shall be subject to the following development and design standards:

   A. A solar energy system is permitted in all zoning districts as an accessory to a principal use.

   B. A solar energy system shall provide power for the principal use and/or accessory use of the property on which the solar energy system is located and shall not be used for the generation of power for the sale of energy to other users, although this provision shall not be interpreted to prohibit the sale of excess power generated from time to time to the local utility company.

   C. A solar energy system connected to the utility grid shall provide written authorization from the local utility company to the [*Township/Borough*] acknowledging and approving such connection.

   D. A solar energy system may be roof mounted [*attachment #1*] or ground mounted [*attachment #2*].

E. A roof mounted system may be mounted on a principal building or accessory building. A roof mounted system, whether mounted on the principal building or accessory building, may not exceed the maximum principal building height or accessory building height specified for the building type in the underlying zoning district. In no instance shall any part of the solar energy system extend beyond the edge of the roof.

F. A ground mounted system shall not exceed the maximum building height for accessory buildings.

G. The surface area of a ground mounted system, regardless of the mounted angle, shall be calculated as part of the overall lot coverage.

H. A ground mounted system or system attached to an accessory building shall not be located within the required front yard setback.

I. The minimum solar energy system setback distance from the property lines shall be equivalent to the building setback or accessory building setback requirement of the underlying zoning district. [*Please note that some municipalities have less stringent accessory structure setbacks, e.g. 10 foot side yard setback for sheds. If accessory structure setbacks are less stringent than the primary structure setback, it is recommended that the municipality require solar energy systems to have the setback requirements of the primary structure in the underlying zoning district.*]

J. All mechanical equipment associated with and necessary for the operation of the solar energy system shall comply with the following:

   a. Mechanical equipment shall be screened from any adjacent property that is residentially zoned or used for residential purposes. The screen shall consist of shrubbery, trees, or other non-invasive plant species which provides a visual screen. In lieu of a planting screen, a decorative fence meeting the requirements of the Zoning Ordinance may be used.

   b. Mechanical equipment shall not be located within the minimum front yard setback of the underlying zoning district.

   c. Mechanical equipment shall comply with the setbacks specified for accessory structures in the underlying zoning district. [*Please note that some municipalities have less stringent accessory structure setbacks, e.g. 10 foot side yard setback for sheds. If accessory structure setbacks are less stringent than the primary structure setback, it is recommended that the municipality require*

solar energy systems to have the setback requirements of the primary structure in the underlying zoning district.]

K. Solar panels shall be placed such that concentrated solar radiation or glare shall not be directed onto nearby properties or roadways.

L. Solar panels shall not be placed in the vicinity of any airport in a manner that would interfere with airport flight patterns. Acknowledgement from the Federal Aviation Administration may be necessary.

M. All power transmission lines from a ground mounted solar energy system to any building or other structure shall be located underground.

N. A solar energy system shall not be used to display advertising, including signage, streamers, pennants, spinners, reflectors, ribbons, tinsel, balloons, flags, banners or similar materials. The manufacturers and equipment information, warning, or indication of ownership shall be allowed on any equipment of the solar energy system provided they comply with the prevailing sign regulations.

O. A solar energy system shall not be constructed until a building/zoning permit has been approved and issued.

P. The design of the solar energy system shall conform to applicable industry standards. A building permit shall be obtained for a solar energy system per the Pennsylvania Uniform Construction Code (UCC), Act 45 of 1999, as amended, and the regulations adopted by the Department of Labor and Industry. All wiring shall comply with the applicable version of the National Electric Code (NEC). The local utility provider shall be contacted to determine grid interconnection and net metering policies. The Applicant shall submit certificates of design compliance obtained by the equipment manufacturer from a certifying organization and any such design shall be certified by an Engineer registered in the Commonwealth of Pennsylvania. [*Please note that the existing roof structure and the weight of the solar energy system shall be taken into consideration when applying for a solar energy system permit*].

Q. The solar energy system shall comply with all applicable [*Township/Borough*] Ordinances and Codes so as to ensure the structural integrity of such solar energy system.

R. Before any construction can commence on any solar energy system the property owner must acknowledge that he/she is the responsible party for owning and maintaining the solar energy system.

2. If a ground mounted solar energy system is removed, any earth disturbance as a result of the removal of the ground mounted solar energy system shall be graded and reseeded.

3. If a ground mounted solar energy system has been abandoned (meaning not having been in operation for a period of six (6) months) or is defective or is deemed to be unsafe by the [*Township/Borough*] Building Code Official, the solar energy system shall be required to be repaired by the owner to meet federal, state and local safety standards, or be removed by the property owner within the time period allowed by the [*Township/Borough*] Building Code Official. If the owner fails to remove or repair the defective or abandoned solar energy system, the [*Township/Borough*] may pursue a legal action to have the system removed at the owner's expense.

Section 4. All other portions, parts and provisions of the Zoning Ordinance of [*Municipality name*], as heretofore enacted and amended, shall remain in force and effect.

Section 5. This Ordinance shall take effect five (5) days after the date of its enactment.

DULY ORDAINED AND ENACTED the _____day of _____, 20__, by the [*Governing Body*] of the Township/Borough of [*Municipality name*], Monroe County, Pennsylvania, in lawful session duly assembled.

[*Governing Body*] of [*Municipality name*]

_____

_____

_____

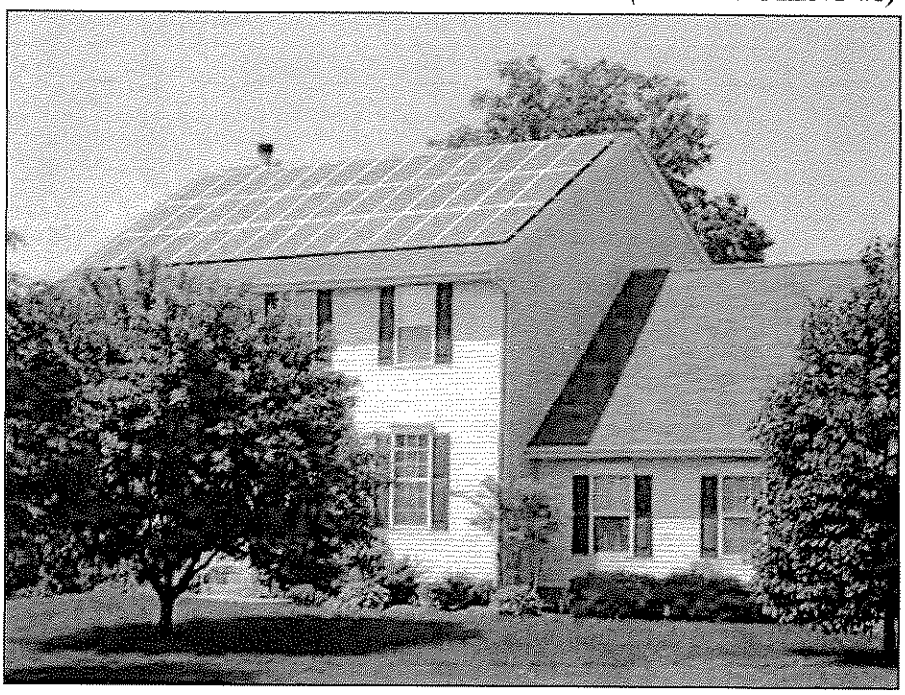
_____

_____

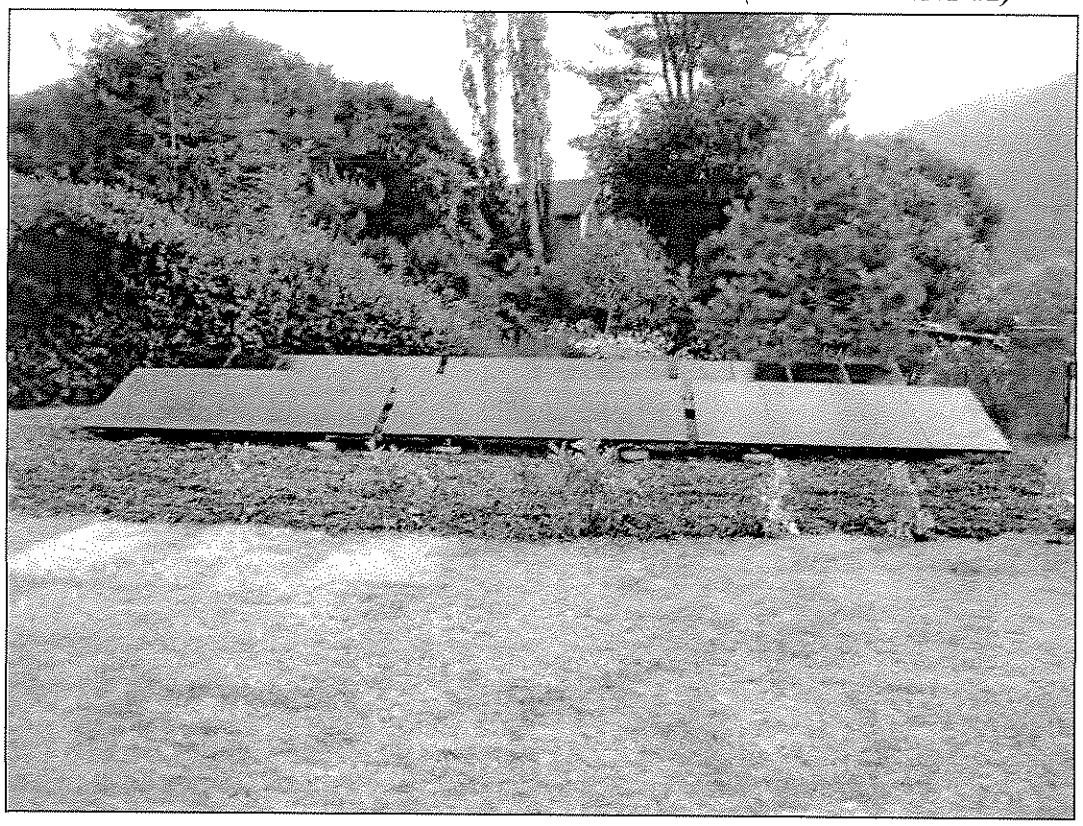
ATTEST:

_____

ROOF MOUNTED SOLAR ENERGY SYSTEM (ATTACHMENT #1)



GROUND MOUNTED SOLAR ENERGY SYSTEM (ATTACHMENT #2)



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KENT COUNTY, MARYLAND

RENEWABLE ENERGY TASK FORCE

Established 9 March 2010

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Solar Energy Systems

Discussion

The RETF members discussed solar energy systems during 6 meetings. This section captures the evolution and end result of that discussion. Unlike wind energy systems which prompted many jurisdictions to address parameters of small and utility scale use through ordinances, solar energy systems are as not commonly addressed in local codes. The task force reviewed a Solar Access Guide produced by the City of Boulder, Colorado and design guidelines from the American Planning Association's *Zoning Practice.* In addition, a solar panel installer Robert Busler addressed the committee (See Appendix B: Solar for a synopsis of guest speaker information and background information).

Considerations

There was very little model solar energy language available from Maryland counties for the RETF to consider. Therefore, the committee built its dialogue from the manner in which they studied wind energy in the previous weeks, beginning with an examination of residential use versus utility scale use of solar energy technology.

The committee set about defining the parameters of each type of system. Commercial, or utility scale, systems were established as those containing any device or combination of devices or elements which rely upon direct sunlight as an energy source, including but not limited to any substance or device which collects sunlight for generating energy primarily for use off site. It was also decided that the energy generated by this system could be used to serve on site power needs.

Residential systems were defined as those containing a device or combination of devices or elements which rely upon direct sunlight as an energy source, including but not limited to any substance or device which collects sunlight for generating energy or heating hot water for use on site. However, the energy output could be delivered to a power grid to offset the cost of energy on site.

Notably, the committee quickly came to a consensus on utility scale solar energy, deciding that it should be permitted in the Industrial with clear standards and site plan review.

RETF members discussed the land available in the Industrial District (approximately 1,100 acres) and its main geographic concentration in the County which is located along the Route 301 corridor adjacent to Massey (with additional areas in Worton and near Chestertown). While the committee felt that utility scale solar energy was an appropriate use of that land, they remained concerned about the availability of land zoned Industrial for other desirable permitted uses. Therefore, the RETF decided that only 50 percent of land zoned Industrial should be used to accommodate solar power. Once 25 percent of the land zoned Industrial is occupied by solar energy systems, the County should be directed to re-evaluate this policy.

The committee heard a presentation on the use of solar panel arrays designed to provide electricity to chicken houses. Members agreed that small solar energy systems should be permitted accessory uses on farms. However, members were divided on locating utility scale solar energy systems in the Agricultural district. It was ultimately decided that, with clear conditions, utility scale solar energy systems should be permitted as *special exceptions* in not only the Industrial but also the Agricultural, Commercial, and Commercial Critical Area zoning districts on a limited scale.

Solar Easements

The RETF discussed solar easements and issues of solar access involve neighboring air space, including the height and setback of adjacent buildings and trees. Solar easements seek to create adequate protections for property owners who install solar energy systems while not creating hardships for adjacent property owners. The RETF decided that the County should not adopt solar access protection provisions but rather encourage property owners installing solar energy systems to coordinate with adjoining property owners to obtain solar access protection.

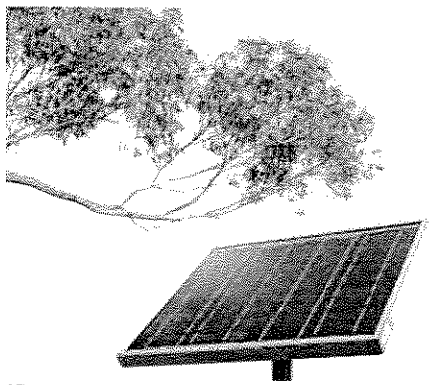


Figure 3: Solar Panel

Safety

The committee discussed fire safety and emergency response issues for solar energy systems. It was decided that an emergency shut off mechanism should be required and notice of its location should be submitted to emergency services.

Visual Aesthetics

Mindful of keeping the balance between the promotion of solar energy systems and the preservation of the County landscape, the RETF decided that, while roof-mounted systems should be permitted as accessory uses or as *special exceptions*, towers should be more closely reviewed. A roof mounted system must meet zoning district height requirements and not extend more than 10 feet from the top of the roof.

To further address aesthetics, the committee established that a solar collection device or combination of devices should be designed and located to avoid glare or reflection onto adjacent properties and roadways and shall not interfere with traffic or create a safety hazard. Also, screening, capable of providing year-round screening, should be provided along all sides of the system that do not actively collect energy.

Kent County solar regulations

Currently, the Land Use Ordinance does not address solar energy panels or systems directly. The few applications that have been submitted to the County for solar panels have been treated as uses customarily accessory to primary uses, such as a single family dwelling or an agricultural operation. All setback and height restrictions in each zoning district would apply to a solar panel/system application. Commercial/utility scale systems are not permitted.

RETF Recommendation:

The task force defined the following terms which apply to proposed zoning text amendments: small solar energy systems and commercial solar energy systems. These terms as defined help to establish the parameters against which small and large solar energy system applications are to be reviewed. The task force felt that it was important to specify that energy production associated with a small solar energy system is to be used on site or to qualify for a utility company credit (aside from output delivered to a power grid to offset on site energy cost).

Following is a summary of the task force recommendations regarding solar energy system uses:

- Permitted Uses, Utility Scale, in the Industrial and Employment Center Districts: Conditions of approval (5) were established to include installation and design specifications which reduce impact on neighboring properties, height limit set at 10 feet above top of roof and set by zoning district (45 foot limit), and registration with the Department of Emergency Services. Site plan review is required.
- Permitted Uses, Small Scale, in Commercial and Commercial Critical Area: Conditions of approval (5) were established to include installation and design specifications which reduce

impact on neighboring properties, height limit set at 10 feet above top of roof and set by zoning district (45 foot limit), and registration with the Department of Emergency Services. Site plan review is required.

- Permitted Uses/*Special Exception*, Utility Scale, in Agricultural and Resource Conservation Districts: Conditions of approval (13) were established to include installation and design specifications which reduce impact on neighboring properties and sites of significant public interest, height limit set at 10 feet above top of roof and set by zoning district (38 foot limit), and registration with the Department of Emergency Services. In addition, the solar collection system shall be incidental to the use of the farm with no alteration of utility infrastructure to accommodate system. Area of use may not exceed 5 acres onsite with no aggregation of solar collection panels on adjacent properties which exceed 5 acres. Area developed by utility scale solar energy system is considered development and counted toward the maximum percentage of the property in lots. Site plan review is required.
- Permitted Uses/*Special Exception*, Utility Scale in Commercial and Commercial Critical Area Districts: Conditions of approval (6) were established to include installation and design specifications which reduce impact on neighboring properties and sites of significant public interest, height limit set at 10 feet above top of roof and set by zoning district (45 foot limit), and registration with the Department of Emergency Services. Site plan review is required.
- Permitted Accessory Uses, Small Scale, in Industrial District: Conditions of approval (5) were established to include installation and design specifications which reduce impact on neighboring properties, height limit set at 10 feet above top of roof and set by zoning district (45 foot limit), and registration with the Department of Emergency Services.
- Permitted Accessory Uses, Small Scale, in Agricultural, Resource Conservation, Rural Character, Rural Residential, Critical Area Residential, Community Residential, Village, and Marine Districts: Conditions of approval (3) were established to include a restriction on tree removal, registration with the Department of Emergency Services, and a height limit established by zoning district.

Solar Energy Systems: Proposed Land Use Ordinance Language

Definitions:

Solar Energy System, Utility Scale: Any device or combination of devices or elements which rely upon direct sunlight as an energy source, including but not limited to any substance or device which collects sunlight for generating energy primarily for use off-site. Energy generated may be used to serve on site power needs.

Solar Energy System, Small: Any device or combination of devices or elements which rely upon direct sunlight as an energy source, including but not limited to any substance or device which collects sunlight for generating energy for use onsite. However, the energy out put may be delivered to a power grid to offset the cost of energy on site.

Permitted Uses

Solar Energy Systems, Utility Scale in EC and I provided:

a) A solar collection device or combination of devices are designed and located to avoid glare or reflection onto adjacent properties and adjacent roadways and shall not interfere with traffic or create a safety hazard.
b) Screening, capable of providing year round screening, is provided along the non-reflective axis of the solar collection device or collection of devices.
c) Roof mounted solar collection devices shall not extend more that 10 feet from the top of the roof. The total height of the building including the solar collection devices shall comply with the height regulations.
d) Solar collection devices shall not exceed 45 feet in height.

e) All solar collection devices shall register with the Department of Emergency Services and shall submit a map noting the location of the solar collection devices and the panel disconnect.

Solar Energy Systems, Small in C and CCA provided:

a) A solar collection device or combination of devices are designed and located to avoid glare or reflection onto adjacent properties and adjacent roadways and shall not interfere with traffic or create a safety hazard.
b) Screening, capable of providing year-round screening, is provided along all sides that do not collect energy.
c) Roof mounted solar collection devices shall not extend more that 10 feet from the top of the roof. The total height of the building including the solar collection devices shall comply with the height regulations.
d) Solar collection devices shall not exceed 45 feet in height.
e) All solar collection devices shall register with the Department of Emergency Services and shall submit a map noting the location of the solar collection devices and the panel disconnect.

Special exceptions

Solar Energy Systems, Utility Scale on farms in the AZD and RCD provided:

a) A solar collection device or combination of devices are designed and located to avoid glare or reflection onto adjacent properties and adjacent roadways and shall not interfere with traffic or create a safety hazard.
b) Screening, capable of providing year-round screening, is provided along all sides that do not collect energy.
c) Roof mounted solar collection devices shall not extend more that 10 feet from the top of the roof. The total height of the building including the solar collection devices shall comply with the height regulations established for each zoning district.
d) Solar collection devices shall not exceed 38 feet in height.
e) The solar collection system shall be incidental to the use of the farm.
f) Installation of the solar collection system shall not adversely impact adjacent properties.
g) All structures associated with the solar collection system shall be neither visually intrusive nor inappropriate to their setting.
h) All solar collection devices shall register with the Department of Emergency Services and shall submit a map noting the location of the solar collection devices and the panel disconnect.
i) Other than wire size, there shall be no alteration of utility infrastructure to accommodate system.
j) Area of use may not exceed 5 acres onsite. Adjacent properties shall not aggregate solar collection panels to achieve an area exceeding 5 acres.
k) In AZD, area developed by utility scale solar energy system is considered development and counted toward the maximum percentage of the property in lots.
l) Tree removal shall be minimized and any removal shall be mitigated in accordance with the Critical Area program requirements.
m) The applicant shall demonstrate that a utility solar energy system shall not unreasonably interfere with the view of, or from, sites of significant public interest such as public parks, a national or state designated scenic byway, a structure listed in the Kent County Historic Site Survey, an historic district, or of the Chesapeake Bay and its tributaries.

Solar Energy Systems, Utility Scale in C and CCA provided:

a) A solar collection device or combination of devices are designed and located to avoid glare or reflection onto adjacent properties and adjacent roadways and shall not interfere with traffic or create a safety hazard.
b) Screening, capable of providing year-round screening, is provided along all sides that do not collect energy.
c) Roof mounted solar collection devices shall not extend more that 10 feet from the top of the roof. The total height of the building including the solar collection devices shall comply with the height regulations.
d) Solar collection devices shall not exceed 45 feet in height.
e) All solar collection devices shall register with the Department of Emergency Services and shall submit a map noting the location of the solar collection devices and the panel disconnect.
f) The applicant shall demonstrate that a utility solar energy system shall not unreasonably interfere with the view of, or from, sites of significant public interest such as public parks, a national or state designated scenic byway, a structure listed in the Kent County Historic Site Survey, an historic district, or of the Chesapeake Bay and its tributaries.

Permitted Accessory Uses

Solar Energy Systems, Small in I provided:

a) A solar collection device or combination of devices are designed and located to avoid glare or reflection onto adjacent properties and adjacent roadways and shall not interfere with traffic or create a safety hazard.
b) Screening, capable of providing year round screening, is provided along the non-reflective axis of the solar collection device or collection of devices.
c) Roof mounted solar collection devices shall not extend more that 10 feet from the top of the roof. The total height of the building including the solar collection devices shall comply with the height regulations.
d) Solar collection devices shall not exceed 45 feet in height.
e) All solar collection devices shall register with the Department of Emergency Services and shall submit a map noting the location of the solar collection devices and the panel disconnect.

Solar Energy Systems, Small in the AZD, RCD, RC, RR, CAR, CR, V, M provided:

a) Tree removal shall be minimized and any removal shall be mitigated in accordance with the Critical Area program requirements.
b) All solar collection devices shall register with the Department of Emergency Services and shall submit a map noting the location of the solar collection devices and the panel disconnect.
c) The total height of solar collection systems shall comply with the height requirements.

Appendix B: Background Information for Solar Energy

Guest Speaker

Robert Busler discussed his experiences as a representative of the solar energy company Standard Solar. He shared examples of roof mounted solar panels on a wide variety of residences and shared his own experience with the roof mounted solar panels installed on his residence in Chestertown's historic district.

In addition to leading a discussion on the aesthetics of solar panel installation, Mr. Busler shared the following topics for the task force's consideration:

- Roof Mounting (left)
  - Alignment with existing roof slope
  - Color of panels
  - Appearance of cell pattern
  - Mounting systems

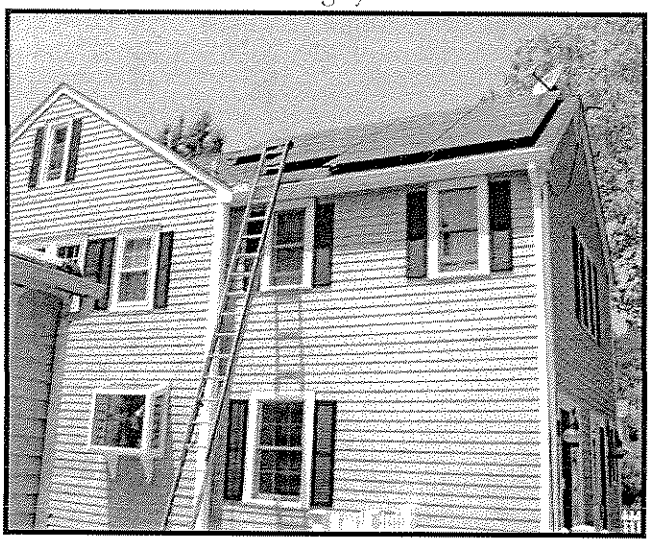


Figure 9: Roof mounting

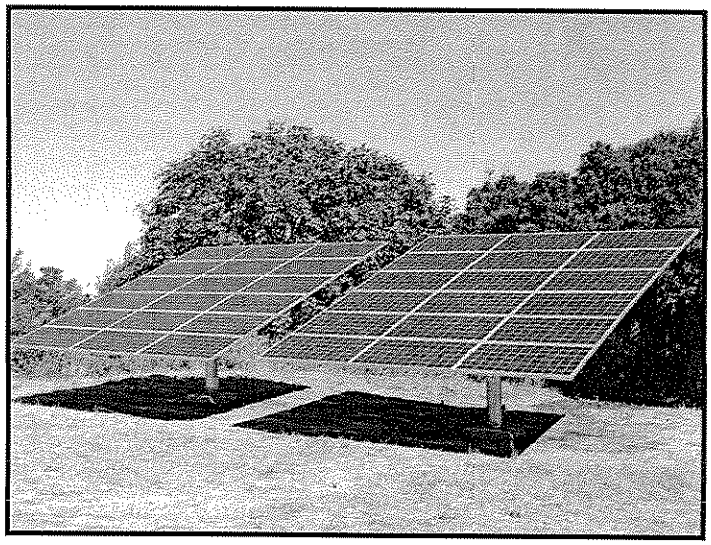


Figure 10: Ground Mounting

- Ground Mounting (right)
  - Height of system
  - Views from neighboring property
  - Glare at 30 degree tilt - none

Background

The most common solar technologies used on buildings in the United States are solar photovoltaic (PV) panels that generate electricity and solar thermal systems that heat water or air. Solar PV produces electricity through the conversion of direct sunlight to energy. The semiconductor materials in the PV cell interact with the sunlight to generate electric current. The most electricity is produced when the sun's rays are directly perpendicular to the PV panels. Since PV only works with sunlight, most systems are also connected to the utility grid to guarantee around-the-clock electricity. The orientation of a PV system affects its performance; usually the best location is on a south-facing roof. Flat roofs allow the panels to be tilted in the optimal direction.

PV systems work best without any obstructions from trees or structures. Because the sun is higher in the summer and lower in winter, placement of the PV involves an assessment of these factors. In any specific location, as the surface area of a PV system exposed to sunlight increases, the amount of electricity produced also increases. Depending on site conditions and economic constraints, residential-scale PV systems can range

Appendix B: Background Information for Solar Energy *continued*

from 100 to 1,000 square feet. ("Balancing the Solar Access Equation", Gail Feldman and Dan Marks, aicp, Zoning Practice 4.09).

Two Sources of Energy: Light and Heat

- Light
  - Photovoltaics (PV) - direct conversion of sunlight to electricity.
- Heat
  - Active solar thermal heats water.
  - Passive solar thermal heats a building through design (windows, orientation, etc.)

Components of Solar PV Systems

- Solar panels – mounted on roof, pole, ground, or other structure
- *Inverter* – DC to AC
- Balance of System (BOS)
  - Charge Controller (battery systems)
  - Disconnect switch (usually *inverter*-integrated)
  - Circuit breaker box
- Backup System – add batteries, different *inverter*, second breaker box, move circuits

Solar Energy Information

Solar energy can be captured and converted into heat or electricity by a number of devices. For example, a result of the fuel shortages in the 1970's, many homes and buildings in the U.S. were fitted with flat collectors that captured solar energy because of the dark color of the collector. This energy was then used to heat water (most often by running a thin film of water directly through the hot panel) to replace conventionally produced hot water. In some cases the energy was used to heat or help heat the home.

There are many methods of collecting solar energy and converting it to electrical power, but in general most systems can be classified as belonging to either of two main groups. The first group is made up of photovoltaics (PV), as discussed above. There is also Concentrating Solar PV (CPV) which uses a lens to increase the available sunlight onto a much smaller but more efficient PV cell, but the system must be mounted on a two axis tracker to constantly and accurately point the lens at the sun. The second main group is comprised of concentrating solar power (CSP) in which parabolic troughs are used to concentrate sunlight onto a central pipe filled with oil which absorbs the energy as heat. This oil is then circulated to a heat exchanger which then is used to ultimately generate steam to drive a turbine and generator (much like fossil fuel electrical production). Most small-scale solar power systems employ photovoltaics.

The most common form of PV is the rigid silicon crystal solar cell. One of these PV cells is manufactured by arranging many thinly cut layers of silicon crystal in large flat rigid, glass covered sheets called cells, which in turn are arranged in collections called arrays. These arrays are often seen on roofs of residences, businesses, and public buildings; covering large areas of usually southern exposures, supported by racks that hold them at varied angles aimed at the sun.

Sometimes these same arrays are ground mounted on racks or poles. They can be rigidly mounted, or on poles that let the arrays move to follow the sun from East to West, or from the horizon to the high noon for

Appendix B: Background Information for Solar Energy *continued*

cost considerations, they are rigidly mounted at an average angle, usually an angle in degrees equal to or near position, or both simultaneously. Efficiency is improved when the panels can track the sun. Most commonly, the geographical latitude of the array (39 to 40 degrees for Kent County). Usually they are mounted facing south as near as possible, given other considerations such as roofline layout or landscaping.

These cells turn sunlight into electricity due to the unique ability of the specially treated silicon to shed an electron that will then follow a circuit the manufacturer laid out in the construction of the cell. Electrons excited by the sunlight falling on the surface of the cell can move about, creating an electrical current which travels from the cell to a load (such as the electrical devices in a home) and back to the cell.

Generally, the trip goes first to an *inverter*, which changes the DC current from the cell to AC current (which can be used in the home or business), then on to a distribution panel, such as the one that houses the circuit breakers for your house.

If you are connected to the electrical grid, the power you do not use for your household loads at the very instant the current is created will flow backwards through your electrical meter to the rest of the grid, turning your meter backwards if you have one meter, or registering on your "watts produced" meter if you have two.

If you are not connected to the grid, the current may go directly from the PV array to a bank of batteries for storage, from which it is later taken and either used directly to power DC lights and appliances or converted into AC. A system of this type that is also connected to the grid must have either an automatic or manual disconnect switch that allows connection to only one source (grid or solar array) at a time.

Other types of less common solar collectors include thin cell PV and concentrating solar PV collectors. Thin cell solar is just that: a very thin and flexible cell structure printed on a plastic scrim with an adhesive backing that can be applied as a building material on roofs or external walls of buildings. It is a less efficient collector of solar energy than silicon crystal, but many times cheaper, and its flexibility allows it to be incorporated into the structure rather than being an add-on.

Concentrating solar is a PV cell that has its own concentrating device looking like a reverse Fresnel lens (like those used to concentrate the beams in lighthouses) which concentrates the solar energy many times, allowing for a smaller but more efficient solar cell. This cell must have a two-axis pointing device so that the cell is always pointed directly at the sun.

Researchers are also searching for materials other than silicon that can be used in PV. Suitable materials will decrease the cost of solar panels by either increasing efficiency (more sunlight captured) or decreasing the cost of manufacture, or both.

The unit of measure of how much electrical power a solar array produces is the *kilowatt hour* (kWh) which is the number of *kilowatts* (kW) produced in one hour of time. The size of an array is rated by how many kWh's it can be expected to produce, in perfect solar conditions, in one hour. An array that can be expected to produce 5 kW's in one hour is rated as a 5kW system. Larger commercial systems are measured in *Megawatts* (mW), with a *megawatt* being equal to 1000 *kilowatts*.

INTRODUCTION

Model Solar Energy Standards

This ordinance is based primarily on the model solar energy ordinance created for Solar Minnesota, under a Million Solar Roofs grant from the U.S. Department of Energy.

In spite of its cold and dark reputation, Minnesota has good solar potential, as good as Houston, Texas and many parts of Florida. As solar energy system components have become more efficient and less costly an increasing number of solar energy installations have been installed in Minnesota. Since 2005, the interest in solar energy has rapidly increased such that many communities have had to address solar installations as a land use issue. Solar energy components continue to improve in efficiency and decline in price, and "cost parity" with some retail electric and natural gas costs is likely within the next 8 to 10 years.

But solar energy is much more than an alternative (or supplement) to utility power. Solar energy has become a symbol of energy self-sufficiency and environmental sustainability. The growth in solar installations is attributable more to the non-economic benefits than as an economic substitute for the electric utility. Households and businesses wanting to reduce their carbon footprint see solar energy as a strong complement to energy efficiency. Volatility in natural gas prices makes free solar fuel look attractive as a price hedge.

Solar energy issues

Local governments will need to address solar energy installations in their development regulation in the near future. Three primary issues tie solar energy to development regulations:

1) *Climate protection goals.* Local governments that have committed to meeting climate protection goals can meet some of their commitment by removing regulatory barriers to solar energy and incorporating low or no-cost incentives in development regulations to spur solar investment.
2) *Nuisance and safety considerations.* Solar systems have few nuisances, but visual impacts and safety concerns by neighbors sometimes create opposition to solar installations. Good design and attention to aesthetics can answer most concerns. But the misperception that solar systems are ugly and unsafe, rooted in poorly designed 1970s solar installations, have resulted in unnecessary regulation or outright prohibitions.
3) *Solar access considerations.* In fully built-out communities and large lot suburban or exurban areas, solar access is of limited concern. Solar access is, however, an important consideration in zoning districts that allow tall buildings or in developing communities where subdivisions should incorporate solar access provisions.

Components of a solar standards ordinance

Solar energy standards should consider the following elements:

- Remove regulatory barriers and create a clear regulatory path to approving solar energy systems.
- Limit aesthetic objections by setting reasonable design standards for solar energy in urban neighborhoods, historic districts, and new subdivisions.
- Address solar access issues in subdivisions and zoning districts that allow taller buildings on smaller (urban density) lots.
- Encourage solar-ready subdivision and building design.
- Incorporate regulatory incentives that can spur private-sector solar investment.

Urban and Rural Communities

The model ordinance language addresses concerns that are primarily in cities rather than counties or townships. Issues of solar access and nuisances associated with solar systems are generally of little consequence outside urban density areas, where lot sizes are almost always greater than one acre. Counties and townships can address most barriers by simply stating in their development regulations that solar systems are an allowed accessory use in all districts. Aesthetic issues or solar access issues might come into play in lakeshore areas or conservation development areas, where homes are closer together or protected trees might limit solar access. The incentive potion of the model ordinance can also be applied in rural areas. However, most of the language in this model ordinance is directed to situations seen in cities.

Primary and Assessory Uses

This ordinance addresses solar energy as an accessory use to the primary residential or commercial use in an urban area. Solar systems are also sometimes the primary use, on "solar farms" that are large arrays of hundreds or thousands of kilowatts of ground or pole-mountd sytems, or in the case of solar thermal powerplants, such as seen in the desert southwest. These land uses have different issues and need to be addressed in a substantially different manner than discussed in this model.

I. Scope - This article applies to all solar energy installations in Model Community.

II. Purpose - Model Community has adopted this regulation for the following purposes:

A. **Comprehensive Plan Goals** - To meet the goals of the Comprehensive Plan and preserve the health, safety and welfare of the Community's citizens by promote the safe, effective and efficient use of active solar energy systems installed to reduce the on-site consumption of fossil fuels or utility-supplied electric energy. The following solar energy standards specifically implement the following goals from the Comprehensive Plan:

1. **Goal** – Encourage the use of local renewable energy resources, including appropriate applications for wind, solar, and biomass energy.
2. **Goal** – Promote sustainable building design and management practices in residential, commercial, and industrial buildings to serve the needs of current and future generations.
3. **Goal** – Assist local businesses to lower financial and regulatory risks and improve their economic, community, and environmental sustainability.
4. **Goal** – Efficiently invest in and manage public infrastructure systems to support development and growth.

Comprehensive Plan Goals

Tying the solar energy ordinance to Comprehensive Plan goals is particularly important when the solar standards include regulatory incentives or solar requirements as described in the last section of this ordinance. If the Comprehensive Plan does not include goals that could address solar energy, and the community does not have some of policy foundation for encouraging private investment in solar energy (such as climate protection goals) the community should consider creating a local energy plan.

B. **Climate Change Goals** - As a signatory of the Cool Cities program, Model Community has committed to reducing carbon and other greenhouse gas emissions. Solar energy is an abundant, renewable, and nonpolluting energy resource and that its conversion to electricity or heat will reduce our dependence on nonrenewable energy resources and decrease the air and water pollution that results from the use of conventional energy sources.

C. **Infrastructure** - Distributed solar photovoltaic systems will enhance the reliability and power quality of the power grid and make more efficient use of Model Community's electric distribution infrastructure.

D. **Local Resource** - Solar energy is an underused local energy resource and encouraging the use of solar energy will diversify the community's energy supply portfolio and exposure to fiscal risks associated with fossil fuels.

E. **Improve Competitive Markets** - Solar energy systems offer additional energy choice to consumers and will improve competition in the electricity and natural gas supply market.

Climate Protection Strategies

Solar energy should be part of every community's portfolio for addressing climate change or energy transitions (also known as "peak oil") considerations. Local governments that are participating in the Cities for Climate Protection program, Mayor's Climate Protection signatories, or the Cool Cities/Cool Counties program can use private solar investment as a vehicle for meeting goals. Additional community benefits that improve sustainability are also spelled out in the findings section.

III. Definitions

Active Solar System - A solar energy system whose primary purpose is to harvest energy by transforming solar energy into another form of energy or transfering heat from a collector to another medium using mechanical, electrical, or chemical means.

Building-integrated Solar Systems - An active solar system that is an integral part of a principal or accessory building, rather than a separate mechanical device, replacing or substituting for an architectural or structural component of the building. Building-integrated systems include but are not limited to photovoltaic or hot water solar systems that are contained within roofing materials, windows, skylights, and awnings.

Grid-intertie Solar System - A photovoltaic solar system that is connected to an electric circuit served by an electric utility company.

Off-grid Solar System - A photovoltaic solar system in which the circuits energized by the solar system are not electrically connected in any way to electric circuits that are served by an electric utility company.

Passive Solar System - A solar energy system that captures solar light or heat without transforming it to another form of energy or transferring the energy via a heat exchanger.

Photovoltaic System - An active solar energy system that converts solar energy directly into electricity.

Renewable Energy Easement, Solar Energy Easement - An easement that limits the height or location, or both, of permissible development on the burdened land in terms of a structure or vegetation, or both, for the purpose of providing access for the benefited land to wind or sunlight passing over the burdened land.

Renewable Energy System - A solar energy or wind energy system. Renewable energy systems do not include passive systems that serve a dual function, such as a greenhouse or window.

Roof Pitch - The final exterior slope of a building roof calculated by the rise over the run, typically but not exclusively expressed in twelfths such as 3/12, 9/12, 12/12.

Solar Access - A view of the sun, from any point on the collector surface, that is not obscured by any vegetation, building, or object located on parcels of land other than the parcel upon which the solar collector is located, between the hours of 9:00 AM and 3:00 PM Standard time on any day of the year.

Solar Definitions

Not all these terms are used in this model ordinance, nor is this a complete list of solar definitions. As a community develops its own design standards for solar technology, many of the concepts defined here may be helpful in meeting local goals. For instance, solar daylighting devices may change the exterior appearance of the building, and the community may choose to distinguish between these devices and other architectural changes.

Solar Collector - A device, structure or a part of a device or structure for which the primary purpose is to transform solar radiant energy into thermal, mechanical, chemical, or electrical energy.

Solar Collector Surface - Any part of a solar collector that absorbs solar energy for use in the collector's energy transformation process. Collector surface does not include frames, supports and mounting hardware.

Solar Daylighting - A device specifically designed to capture and redirect the visible portion of the solar spectrum, while controlling the infrared portion, for use in illuminating interior building spaces in lieu of artificial lighting.

Solar Energy - Radiant energy received from the sun that can be collected in the form of heat or light by a solar collector.

Solar Energy Device - A system or series of mechanisms designed primarily to provide heating, cooling, electrical power, mechanical power, solar daylighting or to provide any combination of the foregoing by means of collecting and transferring solar generated energy into such uses either by active or passive means. Such systems may also have the capability of storing such energy for future utilization. Passive solar systems shall clearly be designed as a solar energy device such as a trombe wall and not merely a part of a normal structure such as a window.

Solar Energy System - A device or structural design feature, a substantial purpose of which is to provide daylight for interior lighting or provide for the collection, storage and distribution of solar energy for space heating or cooling, electricity generating, or water heating.

Solar Heat Exchanger - A component of a solar energy device that is used to transfer heat from one substance to another, either liquid or gas.

Solar Hot Air System - (also referred to as Solar Air Heat or Solar Furnace) – An active solar system that includes a solar collector to provide direct supplemental space heating by heating and re-circulating conditioned building air. The most efficient performance typically means vertically mounted on a south-facing wall.

Solar Hot Water System (also referred to as Solar Thermal) - A system that includes a solar collector and a heat exchanger that heats or preheats water for building heating systems or other hot water needs, including residential domestic hot water and hot water for commercial processes.

Solar Mounting Devices - Devices that allow the mounting of a solar collector onto a roof surface or the ground.

Solar Storage Unit - A component of a solar energy device that is used to store solar generated electricity or heat for later use.

Height - Ground or Pole Mounted

This ordinance sets a 20-foot height limit, assuming a standard that is higher than typical height limits for accessory structures, but well lower than the principal structure. Communities may want to consider allowing taller systems if set back farther, for instance, an extra foot of height for every additional two feet of setback. Communities may also consider allowing higher systems if the size of the panel is less than allowed, for instance, an additional foot of height for every 10 sq. ft. of reduction of surface area.

Building Integrated PV

Building integrated solar systems can include solar systems built into roofing (existing technology includes both solar shingles and solar roofing tiles), into awnings, skylights, and walls. This ordinance only addresses building integrated PV, but examples of building integrated solar thermal applications may also be available.

Mounted Solar Systems

This ordinance sets a threshold for solar panels that they be no more than 5% steeper than the finished roof pitch. Mounted systems steeper than the finished roof pitch change the appearance of the roof, and are exposed to additional safety considerations in regard to the wind and drift load on structural roof components.

IV. Permitted Accessory Use - Active solar energy systems shall be allowed as an accessory use in all zoning classifications where structures of any sort are allowed, subject to certain requirements as set forth below. Active solar energy systems that do not meet the visibility standards in C. below will require a conditional use permit, except as provided in Section V. (Administrative Variances).

A. **Height** - Active solar systems must meet the following height requirements:

1. Building- or roof- mounted solar systems shall not exceed the maximum allowed height in any zoning district. For purposes for height measurement, solar systems other than building-integrated systems shall be considered to be mechanical devices and are restricted consistent with other building-mounted mechanical devices.
2. Ground- or pole-mounted solar systems shall not exceed 20 feet in height when oriented at maximum tilt.

B. **Set-back** - Active solar systems must meet the accessory structure setback for the zoning district and primary land use associated with the lot on which the system is located.

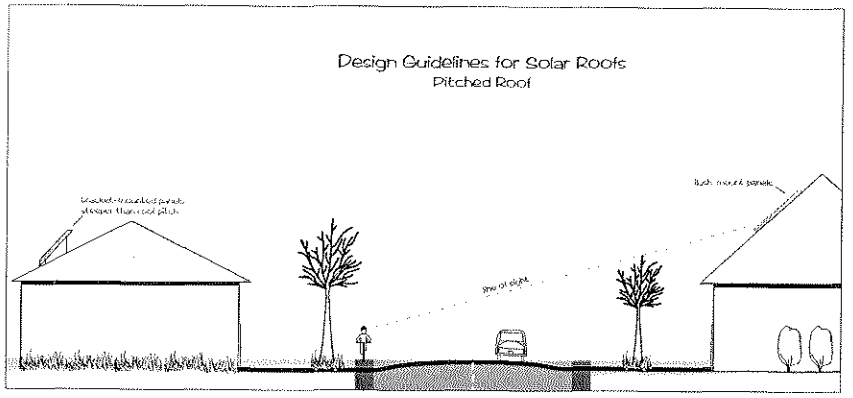
1. **Roof-mounted Solar Systems** - In addition to the building setback, the collector surface and mounting devices for roof-mounted solar systems shall not extend beyond the exterior perimeter of the building on which the system is mounted or built. Exterior piping for solar hot water systems shall be allowed to extend beyond the perimeter of the building on a side yard exposure.
2. **Ground-mounted Solar Systems** - Ground-mounted solar energy systems may not extend into the side-yard or rear setback when oriented at minimum design tilt.

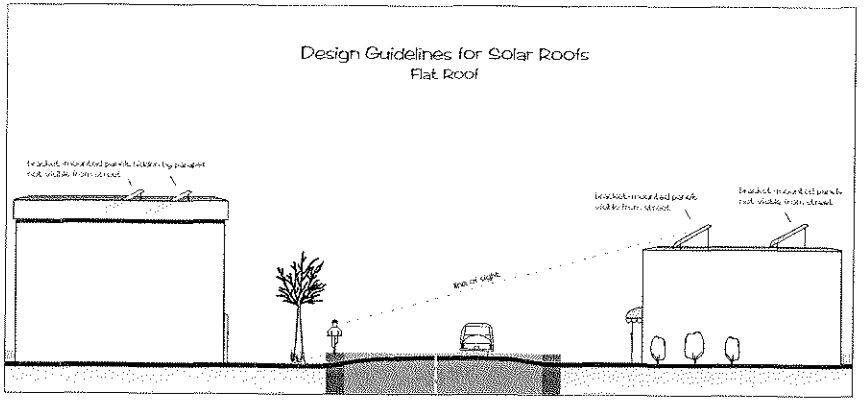
C. **Visibility** - Active solar systems shall be designed to blend into the architecture of the building or be screened from routine view from public right-of-ways other than alleys. The color of the solar collector is not required to be consistent with other roofing materials.

1. **Building Integrated Photovoltaic Systems** - Building integrated photovoltaic solar systems shall be allowed regardless of whether the systemis visible from the public right-of-way, provided the building component in which the system is integrated meets all required setback, land use or performance standards for the district in which the building is located.
2. **Solar Systems with Mounting Devices** - Solar systems using roof mounting devices or ground-mount solar systems shall not be restricted if the system is not visible from the closest edge of

any public right-of-way other than an alley. Roof-mount systems that are visible from the nearest edge of the street frontage right-of-way shall not have a highest finished pitch more than five (5) percent steeper than the roof pitch on which the system is mounted, and shall be no higher than twelve (12) inches above the roof.

3. **Coverage** - Roof or building mounted solar systems, excluding building-integrated systems, shall not cover more than 80% of the south-facing or flat roof upon which the panels are mounted, and shall be set back from the roof edge by a minimum of one (1) foot. The surface area of pole or ground mount systems shall not exceed half the building footprint of the principal structure.
4. **Historic Buildings** - Solar systems on buildings within designated historic districts or on locally designated historic buildings (exclusive of State or Federal historic designation) will require an administrative variance, as provided in this ordinance.





D. **Approved Solar Components** - Electric solar system components must have a UL listing and solar hot water systems must have an SRCC rating.

E. **Plan Approval Required** - All solar systems shall require administrative plan approval by Model Community zoning official.

1. **Plan Applications** - Plan applications for solar systems shall be accompanied by to-scale horizontal and vertical (elevation) drawings. The drawings must show the location of the system on the building or on the property for a ground-mount system, including the property lines.
   a. **Pitched Roof Mounted Solar Systems** - For all roof-mounted systems other than a flat roof the elevation must show the highest finished slope of the solar collector and the slope of the finished roof surface on which it is mounted.
   b. **Flat Roof Mounted Solar Systems** - For flat roof applications a drawing shall be submitted showing the distance to the roof edge and any parapets on the building and shall identify the height of the building on the street frontage side, the shortest distance of the system

from the street frontage edge of the building, and the highest finished height of the solar collector above the finished surface of the roof.

2. **Plan Approvals** - Applications that meet the design requirements of this ordinance, and do not require an administrative variance, shall be granted administrative approval by the zoning official and shall not require Planning Commission review. Plan approval does not indicate compliance with Building Code or Electric Code.

F. **Compliance with Building Code** - All active solar systems shall meet approval of local building code officials, consistent with the State of Minnesota Building Code, and solar thermal systems shall comply with HVAC-related requirements of the Energy Code.

G. **Compliance with State Electric Code** - All photovoltaic systems shall comply with the Minnesota State Electric Code.

H. **Compliance with State Plumbing Code** - Solar thermal systems shall comply with applicable Minnesota State Plumbing Code requirements.

I. **Utility Notification** - No grid-intertie photovoltaic system shall be installed until evidence has been given to the Planning and Zoning Department that the owner has submitted notification to the utility company of the customer's intent to install an interconnected customer-owned generator. Off-grid systems are exempt from this requirement.

Administrative Variance

This model language uses an administrative variance process to balance between aesthetic design considerations and the building owner's choice to use the property for generating renewable energy. Administrative variances allow staff to departures from the design standards when such departures are necessary in order to allow for efficient harvest of solar energy, without having to get Planning Commission approval or pay additional fees. The administrative variance standards spell out the conditions that staff would use to judge if the system genuinely could not be designed consistently with Section IV. (such as a lack of solar access except on the front of the building), and the metrics by which staff would judge screening or visual integration with the building. Some communities will have other means to allow this, or will have a conditional use permit process that does not create burdonsome additional regulation.

V. Administrative Variance - Model Community encourages the installation of productive solar energy systems and recognizes that a balance must be achieved between character and aesthetic considerations and the reasonable desire of building owners to harvest their renewable energy resources. Where the standards in Section IV. A., B., or C. cannot be met without diminishing, as defined below, the minimum reasonable performance of the solar system, an administrative variance may be sought from the zoning official. An administrative variance shall be granted if the administrative variance stanadards are met.

A. **Minimum Performance Design Standards** - The following design thresholds are necessary for efficient operation of a solar energy system:

1. **Fixed-Mount Active Solar Energy Systems** - Solar energy systems must be mounted to face with 45 degrees of south (180 degrees azimuth).
2. **Solar electric (photovoltaic) systems** must have a pitch that is within 20 degrees of latitude, a pitch of between 20 and 65 degrees.

Restrictions on solar systems

One of the most common barriers to solar energy in developing areas are restrictive covenants in new subdivisions. The covenants are intended to maintain an the appearance of homes, property values, and saleability. If, however, the local government provides solar design standards that protect against poor design of solar accessory uses, it is reasonable to prevent the developer or homeowner's association from creating unwarranted restrictions on a sustainable source of energy.

3. **Solar Hot Water Systems** - Solar collectors need to be mounted at a pitch between 40 and 60 degrees.

B. **Standards for an Administrative Variance** - A variance shall be granted by the zoning official if the applicant demonstrates that the following safety, performance and aesthetic conditions are met:

1. **Aesthetic Conditions** - The solar system must be designed to blend into the architecture of the building or be screened from routine view from public right-of-ways other than alleys to the maximum extent possible while still allowing the system to be mounted for efficient performance.
2. **Safety Conditions** - All applicable health and safety standards are met.
3. **Non-Tracking Ground-Mounted Systems** - Pole-mounted or ground-mounted active solar systems must be set back from the property line by one foot.

VI. Restrictions on Solar Systems Limited - No homeowners' agreement, covenant, common interest community, or other contract between multiple property owners within a subdivision of Model Community shall restrict or limit solar systems to a greater extent than Model Community' solar energy standards.

VII. Solar Access - Model Community encourages solar access to be protected in all new subdivisions and allows for existing solar to be protected consistent with Minnesota Statutes.

A. Model Community has elected to allow solar easements to be filed, consistent with Minnesota Stat. Chapter 500 Section 30. Any building owner can purchase an easement across neighboring properties to protect access to sunlight. The easement is purchased from or granted by owners of neighboring properties and can apply to buildings, trees, or other structures that would diminish solar access.

B. Model Community may require new subdivisions to identify and create solar easements when solar energy systems are implemented as a condition of a PUD, subdivision, conditional use, or other permit, as specified in Section 8 of this ordinance.

Solar Easements

Minnesota allows the purchase and holding of easements protecting access to solar and wind energy. The easement must specify the following information:

***Required Contents** - Any deed, will, or other instrument that creates a solar or wind easement shall include, but the contents are not limited to:*

(a) A description of the real property subject to the easement and a description of the real property benefiting from the solar or wind easement; and

(b) For solar easements, a description of the vertical and horizontal angles, expressed in degrees and measured from the site of the solar energy system, at which the solar easement extends over the real property subject to the easement, or any other description which defines the three dimensional space, or the place and times of day in which an obstruction to direct sunlight is prohibited or limited;

(c) A description of the vertical and horizontal angles, expressed in degrees, and distances from the site of the wind power system in which an obstruction to the winds is prohibited or limited;

(d) Any terms or conditions under which the easement is granted or may be terminated;

(e) Any provisions for compensation of the owner of the real property benefiting from the easement in the event of interference with the enjoyment of the easement, or compensation of the owner of the real property subject to the easement for maintaining the easement;

(f) Any other provisions necessary or desirable to execute the instrument.

Source: Minnesota Stat. 500.30 Subd. 3.

Renewable Energy Conditions (previous page)

The community can use traditional development tools such as conditional use permits, PUDs, or other discretionary permits to encourage private investment in solar energy systems. This model ordinance notes these opportunities for consideration by local governments. In most cases, additional ordinance language would need to be inserted into the community's ordinances. For instance, a provision that PUD's incorporate solar energy would need to be included in the community's PUD ordinance, or if a condition of a CUP was to make the building solar-ready, this would need to be included in the conditional use permit section of the ordinance.

Solar Roof Incentives

This section of the model ordinance includes a series of incentives that can be incorporated into development regulation. Most cities and many counties make requirements or use incentives to ensure that certain public amenities are included in development. These same tools and incentives can be used to encourage private investment in solar energy. Communities will not want to use all these incentives, but should select which ones make the most sense in their community (or create some other incentive that encourages solar energy). As with any incentive, an important element of creating the incentive is to engage planning or economic development staff in the creation of the incentive, so that staff can assist the developer in taking advantage of the provisions.

VIII. Renewable Energy Condition for Certain Permits

A. **Condition for Rezoning or Conditional Use Permit** - Model Community may, in an area where the local electric distribution system was installed more than twenty years ago, or where the local electric utility has documented a near-term need for additional distribution substation or conductor capacity, require on-site renewable energy systems as a condition for a rezoning or a conditional use permit.

1. The renewable energy condition may only be exercised for new construction or major reconstruction projects.
2. The renewable energy condition may only be exercised for sites that have 90% unimpeded solar or wind energy access, and for which the renewable energy system can reasonably meet all performance standards and building code requirements.

B. **Condition for Planned Unit Development (PUD) Approval** - Model Community may require on-site renewable energy systems as a condition for approval of a PUD permit, in order to mitigate for:

1. Risk to the performance of the local electric distribution system,
2. Increased emissions of greenhouse gases,
3. Other risks or effects inconsistent with Model Community's Comprehensive Plan.

IX. Solar Roof Incentives

Solar Roof Incentives - Model Community has identified the following incentives for development applications or subdivisions that will include buildings using active solar systems.

A. **Density Bonus** - Any application for subdivision of land in the ___ Districts that will allow the development of at least four new lots of record shall be allowed to increase the maximum number of lots by 10% or one lot, whichever is greater, provided all building and wastewater setbacks can be met with the increased density, if the applicant enters into a development agreement guaranteeing at each one kilowatt of PV or 64 square feet of solar hot water collector installed for each new residence.

B. **Vacant Lot Preference** - When Model Community disposes of vacant parcels of land that are under City ownership through auction, Model Community shall award a 10% bid preference up to $5,000 for every kilowatt of solar capacity that is to be incorporated into the fully-built out parcel, when awarding the bid. The bidder must also meet all land use and dimensional requirements, and must post a bond for the amount of the bid preference granted.

C. **Combined Building Code Permit** - On an existing building that is being retrofit with a solar

system, Model Community shall charge no more than one permit fee for a solar system that meets the administrative approval requirements of this ordinance.

D. **Solar Access Variance** - On a site where the solar access standards of the subdivision ordinance are difficult to meet due to topography or road connectivity, the zoning administrator shall grant an administrative exception from the solar access standards provided the applicant meets the following conditions:

1. **Solar Access Lots Identified** - At least __% of the lots, or a minimum of __ lots, are identified as solar development lots.
2. **Covenant Assigned** - Solar access lots are assigned a covenant that homes built upon these lots must include an active solar system. Photovoltaic systems must be at least one (1) KW in capacity and solar thermal systems must have at least 64 square feet of collector area.
3. **Additional Fees Waived** - Model Community will waive any additional fees for filing of the covenant.

E. **Affordable Housing Offset** - On a site where 90% of the potential solar access is unimpeded, and the local electrical distribution system was installed more than twenty years ago, Model Community may substitute a requirement for grid-intertie photovoltaic systems or active solar thermal systems for up to 50% of the affordable housing requirement. For each unit of affordable housing for which a solar energy substitution is made:

1. The photovoltaic system must have at least 2 kilowatts (KW) of capacity with 90% unobstructed solar access.
2. The active solar thermal system must be sized and have sufficient solar access to generate 75% of the estimated domestic hot water load for a family of four.

F. **Commercial Parking Requirement Offset** - On a site where 90% of the potential solar access is unimpeded, and which has access to mass transit within a block of the development site or which has an approved Travel Demand Management (TDM) plan, or which has entered into a shared parking arrangement with another commercial business that has distinct peak parking profiles, Model Community may substitute a requirement for grid-intertie photovoltaic systems or an active solar thermal systems for up to 50% of the parking requirement, up to a maximum of 5 spaces. For each parking space for which a solar energy substitution is made:

1. The photovoltaic system must have at least one (1) kilowatt (KW) of capacity with 90% unobstructed solar access; or

7 (15)

MUNICIPAL GUIDE TO PLANNING FOR AND REGULATING ALTERATIVE ENERGY SYSTEMS

Lancaster County Planning Commission

October 2010

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DEFINITIONS

1. ACCESSORY ANAEROBIC DIGESTER – An anaerobic digester used to convert biogas into electricity, heat, and water and is intended to primarily reduce on-site consumption of utility power. A system is considered a small anaerobic digester only if it supplies electrical or thermal power for on-site use, except that when a property upon which the facility is installed also receives electrical power supplied by a utility company, excess electrical power generated and not presently needed for on-site use may be used by the utility company. Small anaerobic digesters use livestock and poultry manure generated on-site from one (1) farm, and is designed and intended solely to generate power to off-set utility costs. Small anaerobic digesters may include ~~"co~~-digestion" in which the livestock and poultry manure (primary catalyst) may be mixed with other organic materials (secondary catalysts).

2. ACCESSORY SOLAR ENERGY SYSTEM – A solar collection system consisting of one or more roof and/or ground mounted solar collector devices and solar related equipment, which has a rated capacity of less than or equal to ten (10) kilowatts (for electricity) or rated storage volume of the system of less than or equal to two hundred forty (240) gallons or that has a collector area of less than or equal to one thousand (1,000) square feet (for thermal), and is intended to primarily reduce on-site consumption of utility power. A system is considered a small solar energy system only if it supplies electrical or thermal power solely for on-site use, except that when a property upon which the facility is installed also receives electrical power supplied by a utility company, excess electrical power generated and not presently needed for on-site use may be used by the utility company.

3. ACCESSORY WIND ENERGY SYSTEM – A wind energy conversion system consisting of a wind turbine, tower, and associated control or conversion electronics, which has a rated capacity of less than or equal to hundred (100) kilowatts and is intended to primarily reduce on-site consumption of utility power. A system is considered a small wind energy system only if it supplies electrical power solely for on-site use, except that when a parcel on which the system is installed also receives electrical power supplied by a utility company, excess electrical power generated and not presently needed for on-site use may be used by the utility company.

4. ACIDITY(BASICITY) - the amount of acid present in a solution

5. APPLICANT – The person or entity filing application under this ordinance.

6. ANAEROBIC DIGESTER – A facility which main purpose is to use anaerobic digestion processes to convert livestock manure (primary catalyst) and feedstock into biogas, which is generally burned on-site to produce electricity, heat, and water; as well as to manage livestock and poultry manure. Anaerobic digesters may include ~~"co~~-digestion" in which

the livestock and poultry manure (primary catalyst) may be mixed with other organic materials (secondary catalysts). Types of anaerobic digesters include covered anaerobic lagoons, plug-flow, and/or complete mix (or continually stirred tank reactor), along with other appurtenant sites, structures and buildings, electrical infrastructure, transmission lines and other appurtenant structures and facilities.

7. ANAEROBIC DIGESTION - is a series of processes in which microorganisms break down biodegradable material in the absence of oxygen, used for industrial or domestic purposes to manage waste and/or to release energy.

8. ANSI – The American National Standards Institute

9. APCA – Air Pollution Control Act

10. APPURTENANCES – The visible, functional, or ornamental objects accessory to and part of buildings.

11. ASTM – The American Society for Testing and Materials

12. BIOGAS – A fuel consisting of methane, carbon dioxide, and small amounts of water and other compounds produced as part of anaerobic digestion processes.

13. BUILDING CODE – The Municipal Uniform Construction Code Ordinance

14. CLEAN WOOD – Natural wood that has that has been seasoned to reduce its water content and provide more efficient combustion. The term clean wood does not include wood:

    a. Coated with paint, stain, oil, resin or any other preservative, fire retardant or decorative materials;
    b. Impregnated with preservatives or fire retardants;
    c. Exposed to salt water; nor
    d. Manufactured with use of adhesives, polymers or resins, such as strand, particle and veneer lumber and recycled lumber.

15. EPA – United States Environmental Protection Agency

16. GEOTHERMAL TERMS –

    a. Closed Horizontal Loop Geothermal System: A mechanism for heat exchange which consists of the following basic elements: underground loops of piping; heat transfer fluid; a heat pump; an air distribution system. An opening is made in the Earth. A series of pipes are installed into the opening and connected to a heat

exchange system in the building. The pipes form a closed loop and are filled with a heat transfer fluid. The fluid is circulated through the piping from the opening into the heat exchanger and back. The system functions in the same manner as the open loop system except there is no pumping of groundwater. A horizontal closed loop system shall be no more than twenty (20) feet deep.

b. Closed Vertical Loop Geothermal System: A borehole that extends beneath the surface. Pipes are installed with U-bends at the bottom of the borehole. The pipes are connected to the heat exchanger and heat transfer fluid is circulated through the pipes.

c. Geothermal Boreholes: A hole drilled or bored into the earth into which piping is inserted for use in a closed vertical loop geothermal system.

d. Geothermal Energy System: An energy generating system that uses the Earth's thermal properties in conjunction with electricity to provide greater efficiency in the heating and cooling of buildings.

e. Open Horizontal Loop Geothermal System: Water is pumped from a water well or other water source into a heat exchanger located in a surface building. The water drawn from the Earth is then pumped back into the ground through a different well or in some cases the same well, also known as "~~a~~-injection". Alternatively, the groundwater could be discharged to a surface water body also known as a "~~p~~ump and dump". In the heating mode, cooler water is returned to the Earth, and in the cooling mode, warmer water is returned to the surface water body or well.

17. HUB HEIGHT – The distances measured from the surface of the tower foundation to the height of the Wind Turbine hub, to which the blade is attached.

18. METHANOGENS –bacteria found in anaerobic environments such as animal intestinal tracts or sediments or sewage and capable of producing methane.

19. NET METERING – A mechanism that provides a simplified approach for interconnecting and metering on-site renewable generating facilities, such as a solar PV system. It allows customers to use excess solar electric generation to offset utility-purchased electricity on a monthly or annual basis.

20. OCCUPIED BUILDING means a residence, school, hospital, church, public library or other building used for public gathering that is occupied or in use when the permit application is submitted.

21. OUTDOOR WOOD-FIRED BOILER (HYDRONIC HEATER) – A fuel-burning device, also known as an "~~o~~utdoor hydronic heater", "~~o~~utdoor wood-fired furnace", and "~~o~~utdoor wood-burning appliance", designed:

a. to burn clean wood or other fuels specifically tested and listed for use by the manufacturer;
b. by the manufacturer specifically for outdoor installation or installation in structures not normally intended for habitation by humans or domestic animals (e.g., garages); and
c. to heat building space and/or water via distribution, typically through pipes, of a fluid heated in the device, typically water or a water/antifreeze mixture.

22. PHASE 2 OUTDOOR WOOD-FIRED BOILER (HYDRONIC HEATER) – An outdoor wood-fired boiler that has been certified or qualified by the EPA as meeting a particulate matter emission limit of 0.32 pounds per million British Thermal Units (BTU) output and is labeled accordingly, with a white ~~-h~~ang" tag.

23. PHOTOVOLTAIC (PV) – The technology that uses a semiconductor to convert light directly into electricity.

24. PRINCIPAL ANAEROBIC DIGESTER – An anaerobic digester principally used to convert biogas into electricity, heat, and water. Large anaerobic digesters accept both livestock manure (primary catalyst) and feedstock, generated off-site or from more than one (1) farm. Large anaerobic digesters may include ~~-co~~-digestion" in which the livestock and poultry manure (primary catalyst) may be mixed with other organic materials (secondary catalysts).

25. PRINCIPAL SOLAR ENERGY PRODUCTION FACILITY – An area of land or other area used for a solar collection system principally used to capture solar energy and convert it to electrical energy. Large solar energy production facilities consist of one or more free-standing ground, or roof mounted solar collector devices, solar related equipment and other accessory structures and buildings including light reflectors, concentrators, and heat exchangers, substations, electrical infrastructure, transmission lines and other appurtenant structures and facilities, which has a rated capacity of more ten (10) kilowatts (for electricity) or rated storage volume of the system of more than two hundred forty (240) gallons or that has a collector area of more than one thousand (1,000) square feet (for thermal).

26. PRINCIPAL WIND ENERGY PRODUCTION FACILITY – An area of land or other area used for a wind energy conversion system principally used to capture wind energy and convert it to electrical energy. Large wind energy production facilities consist of one or more wind turbines, tower, and associated control or conversion electronics and other accessory structures and buildings including substations, electrical infrastructure, transmission lines and other appurtenant structures and facilities, which has a rated capacity of more than one hundred (100) kilowatts.

27. RESPONSIBLE OFFICIAL– Person designated by the municipality to be responsible for the administration and enforcement of this ordinance.

28. SOLAR COLLECTION SYSTEM – A solar photovoltaic cell, panel, or array, or solar hot air or water collector device, which relies upon solar radiation as an energy source for collection, inversion, storage, and distribution of solar energy for electricity generation or transfer of stored heat.

29. SOLAR RELATED EQUIPMENT – Items including a solar photovoltaic cell, panel, or array, or solar hot air or water collector device panels, lines, pumps, batteries, mounting brackets, framing and possibly foundations used for or intended to be used for collection of solar energy.

30. STACK – Any vertical structure enclosing a flue(s) that carry off smoke or exhaust from a furnace or other fuel-burning device, especially that part of a structure extending above a roof.

31. WET STAMP- A from-scratch calculation performed by a structural engineer of the tower's integrity.

Municipal Guide to Planning for and Regulating

Alternative Energy Systems

The production of alternative forms of energy, either for individual or utility consumption, is a land use not often addressed in most comprehensive plans or zoning ordinances in Lancaster County. However, some municipalities in recent years have often been faced with decisions regarding the appropriate scale and location of these uses in their community. The Pennsylvania Municipalities Planning Code gives local municipalities the authority through comprehensive plans and ordinances to set provisions regulating the placement, construction, operation and maintenance of alternative energy projects. (MPC Sections 105, 301.4.1, and 707.4.viii.1)

The types of alternative energy systems most commonly seen in Lancaster County currently are wind, solar, manure digesters, outdoor wood-fired boilers, and geothermal. Some of these systems, particularly wind, solar, and manure digesters, can vary in the size of the system, the amount of energy produced, and whether that energy is produced primarily for consumption by the property owner or is intended to be transmitted to and sold for the electrical grid.

Before adopting zoning or subdivision and land development ordinance regulations for alternative energy systems, municipalities should first examine and decide the proper location for these uses. The elected and appointed officials should review the land use goals and objectives identified in their comprehensive plan, and the purpose statements for specific zoning districts in their zoning ordinance. These planning documents provide a context to evaluate the appropriateness of specific uses in specific areas of the municipality.

The following is a list of policy points that municipal officials should address in determining the appropriate location and scale of these uses. The list addresses both smaller scale accessory-type applications most typically seen in residential and in some non-residential zoning districts, as well as more land-consumptive and impact-intensive uses typically seen in rural and agricultural zoning districts. A second part of this guide (beginning on page 10) will provide examples of specific zoning ordinance language.

Smaller-scale alternative energy uses

Municipalities should first decide how to allow these types of uses. It is recommended that an alternative energy system, designed primarily to provide energy for a home or business, be allowed as other accessory structures and buildings are. Most often these structures and buildings are permitted by right.

The primary consideration in the approval process for almost all accessory uses, especially in residential zoning districts, is the impact on neighboring properties. These include appearance, odor, noise, increased traffic, and others. Most alternative energy systems pose minimal impacts.

One exception are outdoor wood-fired boilers which because of the emissions produced are usually not permitted in residential zoning districts. The following list examines potential impacts from specific alternative energy systems. The second part of this report will provide examples of zoning ordinance language municipalities have adopted to address these impacts:

1. Height- This is almost exclusively a concern for wind energy systems. These systems will almost always be among the highest structures within a residential, and even a commercial or industrial, zoning district. One wind energy association report recommends that that the bottom of the wind turbine rotor should clear the highest wind obstacle within a 500 foot radius by at least 30 feet. The higher the tower height the more wind power will be produced. Therefore, a municipality must balance neighborhood aesthetics with the energy efficiency of the unit. Although there is no ideal height that balances these concerns, municipal officials should look at the maximum height of similar structures, such as cell tower, flagpoles, and antennas that are allowed in these zoning districts.
2. Setbacks- Most municipalities have required these systems, like other accessory uses, to be located in side or rear yards. Setback distances should be the same as other accessory structures. Because wind turbines have generally been designed to withstand hurricane force winds, requiring an applicant to submit the manufacturer's engineering specifications should be sufficient proof to determine that the system will not fall onto a neighboring property.
3. Signage- Signage should not be permitted on any alternative energy system other than the manufacturer's label or sign.
4. Screening and fencing- Most municipalities do not require applicants to screen or fence these systems. In many instances, especially for solar systems, screening will reduce the energy efficiency of the unit.

Larger-scale alternative energy uses

These types of systems are designed to produce greater levels of energy, either for consumers with higher energy demand levels such as farms or industrial uses, or designed primarily to produce energy to be supplied directly to the electrical grid. Municipalities must look not only at the operational impacts of these uses but also locational concerns as well.

Developers of utility-scale alternative energy systems, especially those designed primarily to produce energy for the electrical grid, often require relatively large parcels of land to locate their facility. Similar to other land-consumptive uses such as school campuses and recreational uses, applicants usually wish to locate these uses in rural areas where it is easier to assemble the required land and the per acreage cost of the land is lower than within a Designated Growth Area. In determining whether to permit these uses, municipalities must first review their land use objectives in their comprehensive plan and the purpose statement of the specific zoning districts.

Most often, the great majority of land in rural areas of Lancaster County is zoned agricultural. Most local and regional comprehensive plans recommend that only agricultural uses, or uses that support the agricultural industry, be allowed. Balance: The Growth Management Element of the Lancaster County Comprehensive Plan also recommends that only land uses that support the agricultural economy be permitted in agricultural areas. Therefore, the Lancaster County Planning Commission has recommended that only electricity produced from manure digesters be permitted as the primary use in the agricultural zoning district. Solar, wind, and other alternative energy sources can be allowed but only as an accessory use. Some municipalities have limited the total amount of land dedicated to this use as a percentage of the total acreage of the farm, oftentimes no more than one or two per cent of the total.

Because most alternative energy uses are not recommended to be the primary land use for properties within the agricultural zoning district, municipalities whether this should be allowed in other zoning districts. However, a municipality may determine that this type of use is also not appropriate in an industrial district because of the large land needs and the lack of employment provided. In these circumstances, larger-scale alternative energy systems may only be permitted as an accessory use.

The following is a list of operational impacts to be considered when permitting larger-scale alternative energy uses:

1. Large-scale, or regional manure digesters bring manure to a site by truck. The municipality should review the number and schedule of truck traffic with the applicant to minimize impacts.
2. Screening of alternative-energy systems in rural areas is generally less of a concern than in residential zoning districts. However, the municipality should look at the proximity of the proposed system to neighboring residences and road frontages and determine whether screening would be appropriate.
3. Outdoor wood-fired boilers should only be allowed in rural or agricultural areas because of the potential airborne impacts from emissions. The PA DEP has produced a Model Ordinance for Outdoor Wood-Fired Boilers that addresses many of the land use issues involved with these uses.

ACCESSORY SOLAR ENERGY SYSTEMS

How Accessory solar energy systems Work

There are two major forms of solar energy technology: photovoltaic (PV) systems and solar thermal systems.

Photovoltaic Systems

Solar electric systems, also known as photovoltaic (PV) systems, convert sunlight into electricity. Photovoltaic power generation employs solar panels comprising a number of cells containing a photovoltaic material. When sunlight is absorbed by these materials, the solar energy knocks electrons loose from their atoms. This phenomenon is called the "photoelectric effect." These free electrons then travel into a circuit built into the solar cell to form electrical current. Only sunlight of certain wavelengths will efficiently create electricity. PV systems still produce electricity on cloudy days, but not as much as on a sunny day.

The basic PV or solar cell typically produces only a small amount of power. To produce more power, solar cells (about 40) can be interconnected to form panels or modules. PV modules range in output from 10 to 300 watts. If more power is needed, several modules can be installed on a building or at ground-level in a rack to form a PV array.

PV arrays can be mounted at a fixed angle facing south, or they can be mounted on a tracking device that follows the sun, allowing them to capture the most sunlight over the course of a day.

(References: *U.S. Department of Energy: Energy Efficiency and Renewable Energy, PA Solar Municipal Guide)*

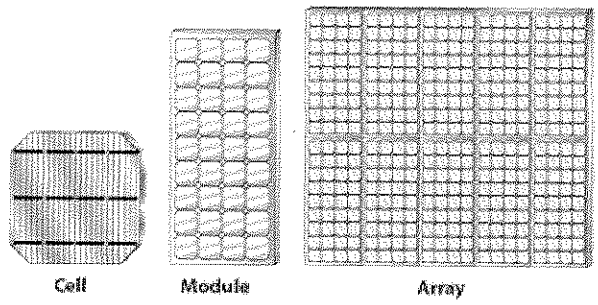

Illustration *from U.S. Department of Energy*

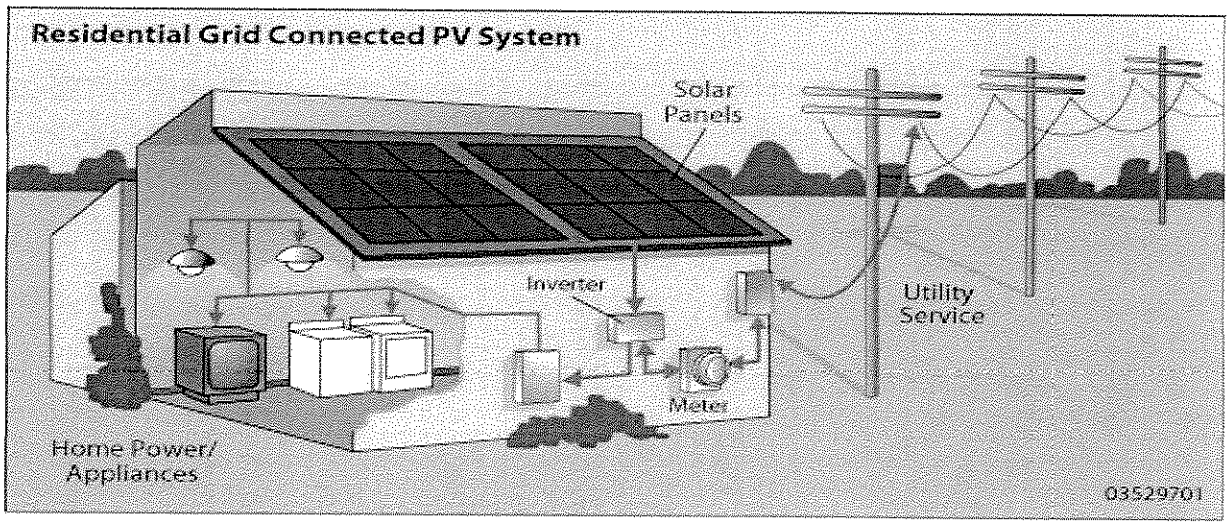

Illustration *from U.S. Department of Energy*

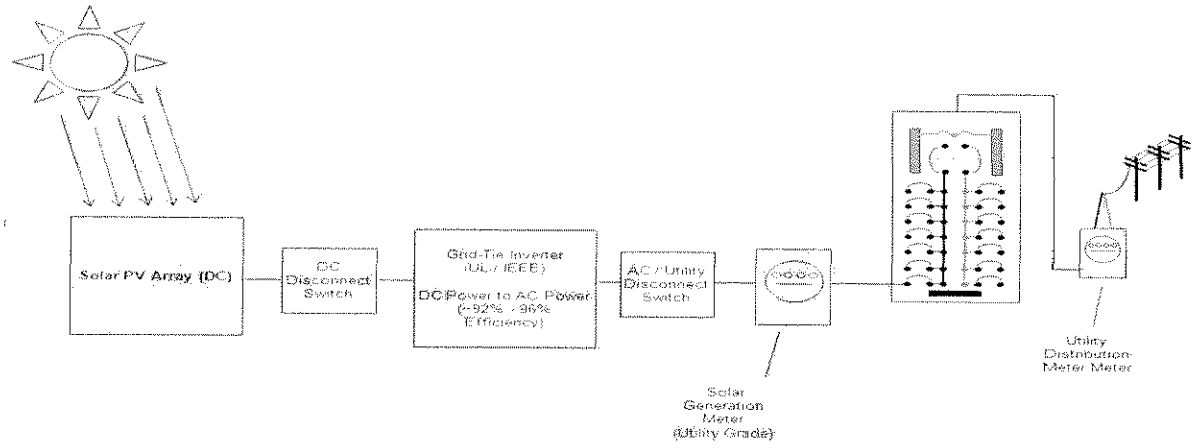

Illustration *from PA Solar Energy Guide*

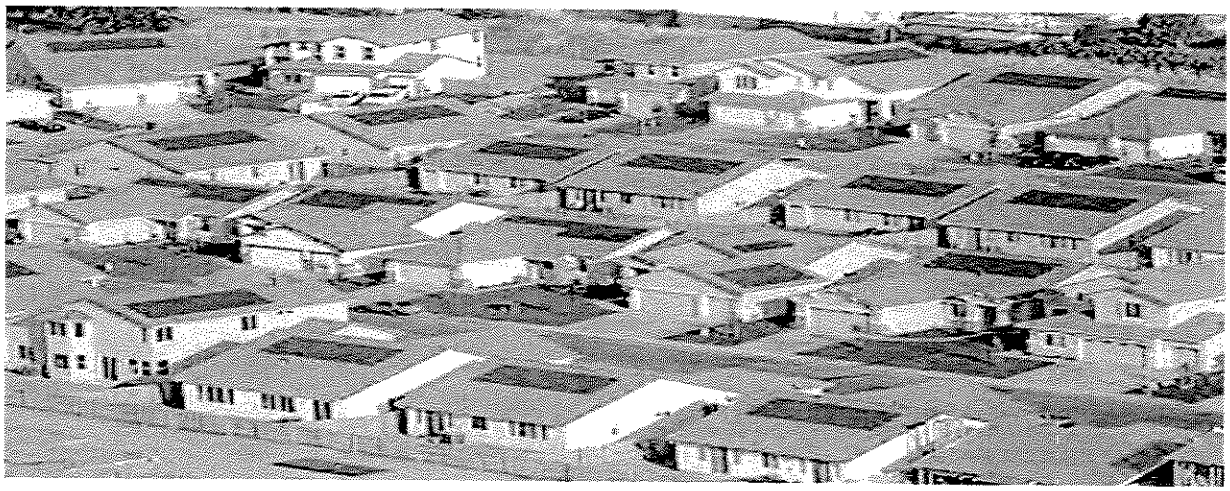

Illustration *from U.S. Department of Energy*

Solar Thermal Systems

Solar thermal systems use solar energy to typically heat a fluid, such as water or an antifreeze solution, or heat a gas, such as air. Solar thermal systems are most commonly utilized for heating residential hot water systems, though they are also used for space heating, spas or swimming pools, and even space cooling.

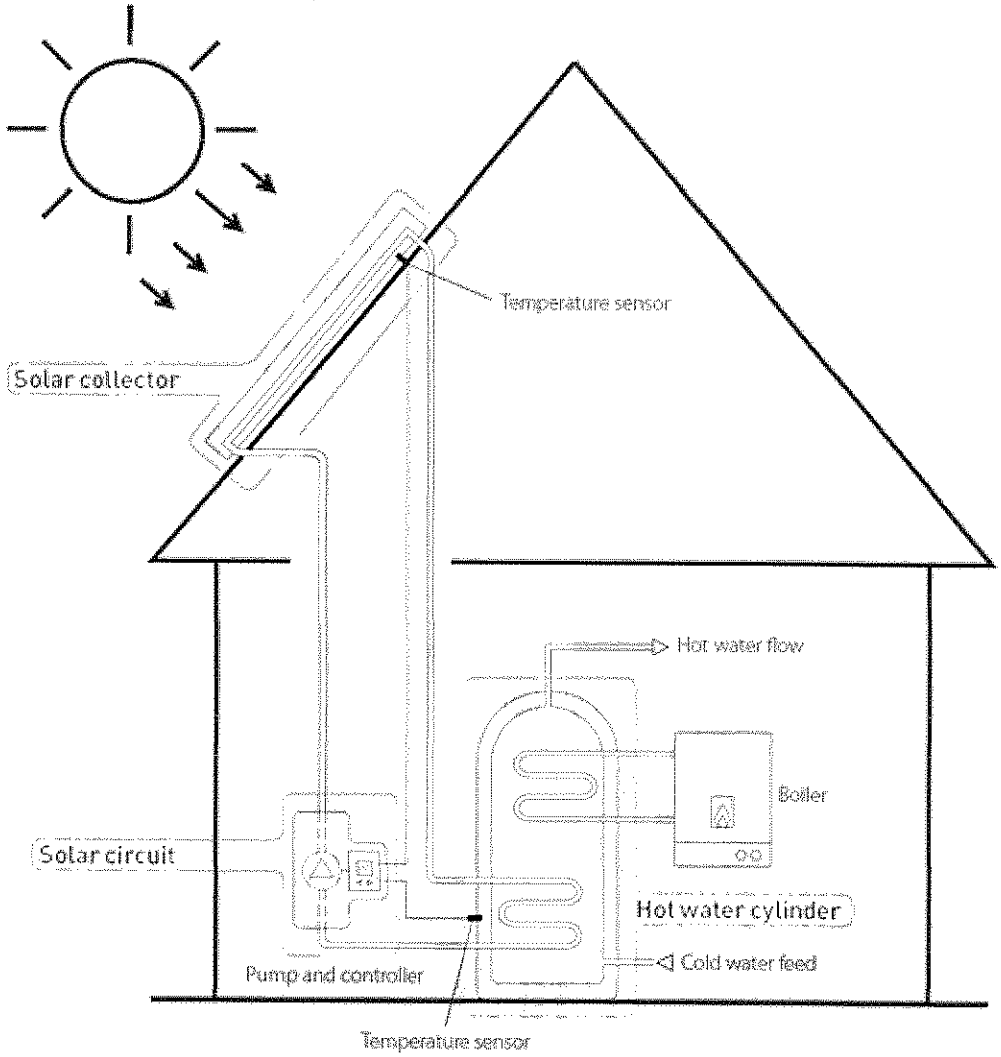

Illustration *from PA Solar Energy Guide*

Municipal Authority

The Pennsylvania Municipalities Planning Code gives municipalities the authority to adopt comprehensive plans (MPC Sections 301a.4.1 and 301.1) and ordinances (MPC Sections503.6 and 604.1) to ensure solar and other alternative energy access, including solar access ordinances, development guidelines requiring proper street orientation, and zoning ordinances that contain building height restrictions to avoid shading neighboring solar panels.

Restrictive Covenants

Despite the recent surge for renewable energy development at the state and local levels, many consumers still face local ordinances and homeowner's association rules that prohibit, restrict, or drastically increase the cost of installing a solar energy system. More than half of U.S. States have solar rights laws that protect consumers from any restrictive covenant. Pennsylvania is not one of the states that have a solar right's or access law.

(References: *Database for State Incentives for Renewables and Efficiency website)*

Model Zoning Language

As solar energy systems become increasingly commonplace in local communities, zoning and subdivision ordinances can provide significant legal structure for ensuring that the integration of solar systems into new and existing building construction and land development aligns with the regulations, goals and expectations of a specific municipality.

Here is an example of model zoning language for solar energy systems:

- **ACCESSORY SOLAR ENERGY SYSTEMS:** Permitted by right as an accessory use in all zoning districts where structures of any sort are allowed, as long as it meets the requirements of this Chapter and all other applicable construction codes as set forth below:

- **Applicability**

    - A system is considered an accessory solar energy system only if it supplies electrical or thermal power primarily for on-site use, except that when a property upon which the facility is installed also receives electrical power supplied by a utility company, excess electrical power generated and not presently needed for on-site use may be used by the utility company. The owner of the accessory solar energy system shall provide written confirmation that the public utility company has been informed of the customer's intent to install an interconnected customer-owned generator and also approves of such connection. Off-grid systems shall be exempt from this requirement.

    - This ordinance applies to Solar Energy Systems to be installed and constructed after the effective date of the ordinance, and all applications for Solar Energy Systems on existing structures or property.

    - Any upgrades, modifications or changes that materially alter the size or placement of an existing Solar Energy System shall comply with the provisions of this Chapter.

- **Design and Installation**

- To the extent applicable, the Solar Energy System shall comply with all applicable building and construction codes as amended and any regulations adopted by the Department of Labor and Industry.

- The design and installation of accessory solar energy systems shall conform to applicable industry standards, including those of the American National Standards Institute (ANSI), Underwriters Laboratories (UL), the American Society for Testing and Materials (ASTM), or other similar certifying organizations, and shall comply with the Municipal Building Code and with all other applicable fire and life safety requirements. The manufacturer specifications shall be submitted as part of the application.

- All exterior electrical and/or plumbing lines must be buried below the surface of the ground and be placed in a conduit.

    - Whenever practical, all accessory solar energy systems shall be attached to a building, or located on an impervious surface. If not designed to be attached to the building, the applicant shall demonstrate by credible evidence that such systems cannot feasibly be attached to a building due to structural imitations of the building.

    - Accessory solar energy systems shall be designed and located in order to prevent reflective glare toward any inhabited structure on adjacent properties as well as adjacent street rights-of-way.

    - No portion of an accessory solar energy system shall be located within or above any front yard, along any street frontage, nor within any required setback of any property.

(This Section is from the PA Municipal Guide for solar Energy Systems and Rapho Township's Alternative Energy Ordinance)

- **Height Restrictions**– Active solar energy systems must meet the following requirements:

    - Building- or roof- mounted solar energy systems shall not exceed the maximum allowed height in any zoning district. For purposes for the height measurement, solar energy systems other than building-integrated systems shall be considered to be mechanical devices and are restricted consistent with other building-mounted mechanical devices

    - Ground- or pole-mounted solar energy systems shall not exceed the minimum accessory structure height within the underlying district.

- **Setback** - Active solar energy systems must meet the accessory structure setback for the zoning district and primary land use associated with the lot on which the system is located.

    - **Roof-mounted Solar Energy Systems** - In addition to the building setback, the collector surface and mounting devices for roof-mounted solar energy systems shall not extend beyond the exterior perimeter of the building on which the system is mounted or built. Exterior piping for solar hot water systems shall be allowed to extend beyond the perimeter of the building on a side yard exposure.

    - **Ground-mounted Solar Energy Systems** - Ground-mounted solar energy systems may not extend into the side-yard or rear setback when oriented at minimum design tilt.
      (Sections 3 and 4 are from the City of Woodbury, MN ordinance for alternative energy)

- **Plan Approval Required** - All solar energy systems shall require administrative plan approval by municipal zoning officials

    - **Plan Applications** - Plan applications for solar energy systems shall be accompanied by to-scale horizontal and vertical (elevation) drawings. The drawings must show the location of the system on the building or on the property for a ground-mount system, including the property lines. Applicants must use an installer who is on DEP's approved list

        - **Pitched Roof Mounted Solar Energy Systems** - For all roof-mounted systems other than a flat roof the elevation must show the highest finished slope of the solar collector and the slope of the finished roof surface on which it is mounted.

        - **Flat Roof Mounted Solar Energy Systems** - For flat roof applications a drawing shall be submitted showing the distance to the roof edge and any parapets on the building and shall identify the height of the building on the street frontage side, the shortest distance of the system from the street frontage edge of the building, and the highest finished height of the solar collector above the finished surface of the roof.

    - **Plan Approvals** - Applications that meet the design requirements of this ordinance, and do not require a conditional use permit, shall be granted administrative approval by the zoning official and shall not require Planning Commission review. Plan approval does not indicate compliance with Building Code or Electric Code.
      (Section 5 is from the PA Municipal Guide for solar Energy Systems)

- **Utility Notification** - The owner of the small solar energy system shall provide written authorization that the public utility company has been informed of the customer's intent to install an interconnected customer-owned generator and also approves of such connection. Off-grid systems shall be exempt from this requirement.
  (This section is from the City of Woodbury, MN ordinance for alternative energy.)

- **Restrictions on Solar energy systems Limited *(Optional)*** - No homeowners' agreement, covenant, common interest community, or other contract between multiple property owners within a subdivision shall restrict or limit solar energy systems to a greater extent than solar performance standards.

  (This section is from the City of Woodbury, MN ordinance for alternative energy. As stated above, there is no solar access 'protection' law in Pennsylvania.)

PRINCIPAL SOLAR ENERGY SYSTEMS

What Are Principal solar energy systems?

Principal solar energy systems or concentrated solar power (CSP) systems use lenses or mirrors to focus a large area of sunlight onto a small area. Electrical power is produced when the concentrated light is directed onto photovoltaic surfaces or used to heat a transfer fluid for a conventional power plant. Large solar energy production facilities consist of one or more free-standing ground, or roof mounted solar collector devices, solar related equipment and other accessory structures and buildings including light reflectors, concentrators, and heat exchangers, substations, electrical infrastructure, transmission lines and other appurtenant structures and facilities, which has a rated capacity of more ten (10) kilowatts (for electricity) or rated storage volume of the system of more than two hundred forty (240) gallons or that has a collector area of more than one thousand (1,000) square feet (for thermal). There are two types of large solar electric generating technologies: photovoltaic panels and solar thermal systems.

(References: *U.S. Department of Energy: Energy Efficiency and Renewable Energy, Database for State Incentives for Renewables and Efficiency website*)

Photovoltaic Systems

Photovoltaic (PV) systems employ sunlight concentrated onto photovoltaic surfaces for the purpose of electrical power production. Solar concentrators of all varieties may be used, and these are often mounted on a solar tracker in order to keep the focal point upon the cell as the sun moves across the sky.

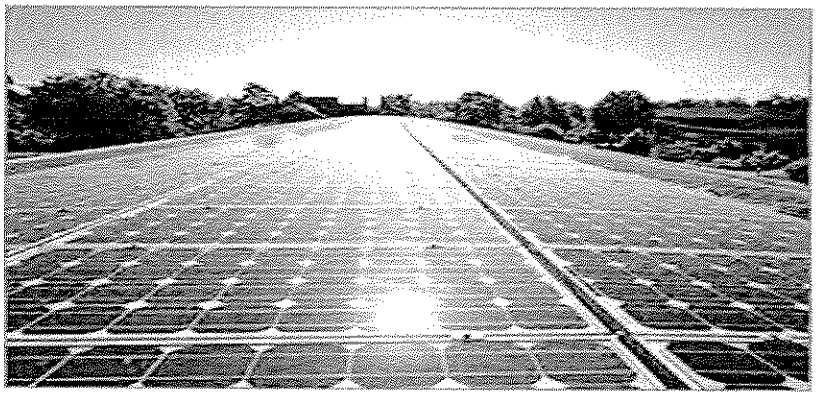

Illustration from U.S. Department of Energy

Solar Thermal Systems

Solar-thermal electric generation technology uses the sun's energy to power a steam turbine. Solar-thermal systems use lenses or mirrors and tracking systems to focus a large area of sunlight onto a small area. The concentrated light is then used as heat or as a heat source for a conventional power plant.

(References: *U.S. Department of Energy: Energy Efficiency and Renewable Energy, Database for State Incentives for Renewables and Efficiency website*)

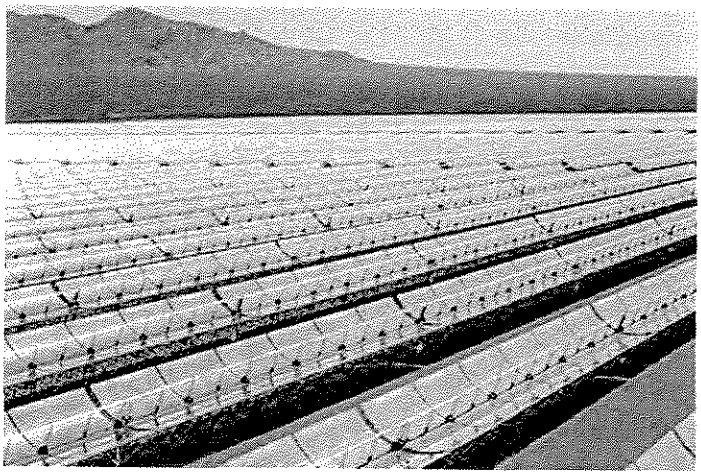

Illustration from U.S. Department of Energy

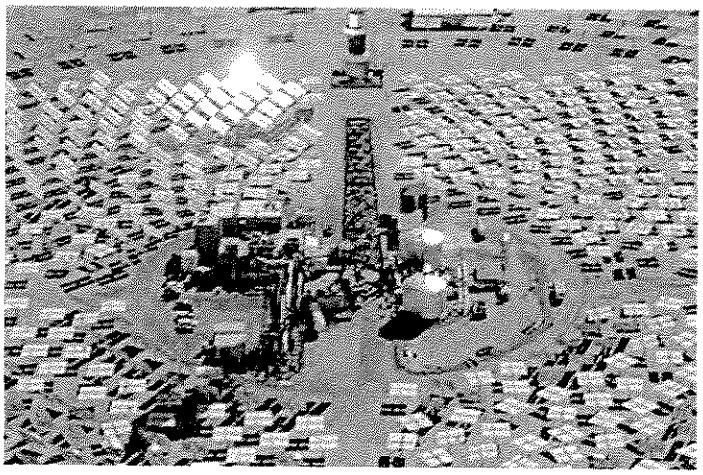

Illustration from U.S. Department of Energy

Power Tower Systems—includes links to R&D being done within other CSP areas, but that are relevant to heliostats, receivers, and overall systems issues for central-receiver solar plants.

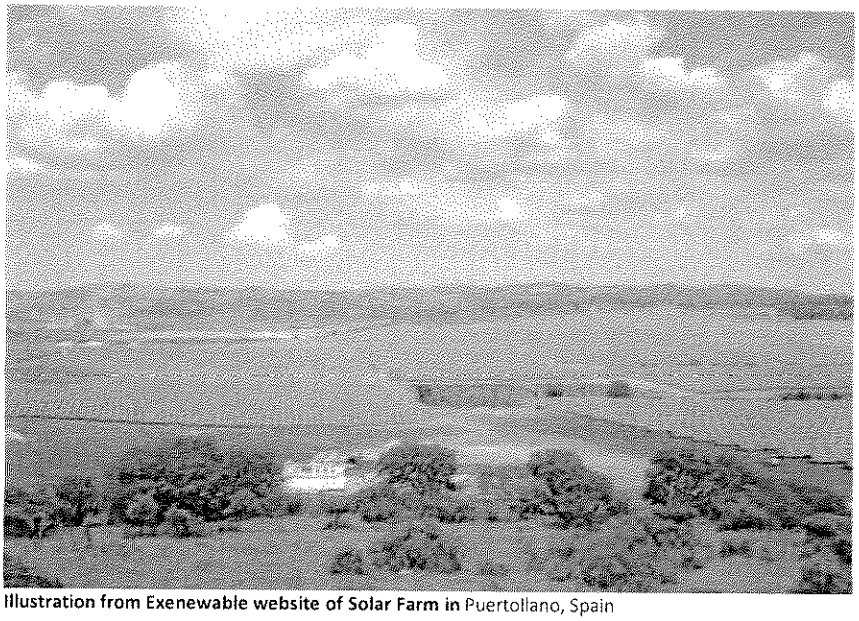

Illustration from Exenewable website of Solar Farm in Puertollano, Spain

Pervious or impervious

With the recent trend to build solar energy plants, new land use questions concerning solar energy projects have been raised. One of the main questions local governments must deal with is: Do these ground-mounted solar panels constitute impervious coverage or not? This is an important question to consider if one of these large-scale projects is built on prime agricultural land or near a major water resource. Opinions on this issue vary. Professionals in the solar industry don't consider solar panels as a solid surface because of their slanted positions and the spacing between each panel, thereby they are not impervious. In April 2010, the State of New Jersey passed a law that exempts solar panels from the calculation of impervious cover under a number of state laws. Mount Joy and RaphoTownships, Lancaster County, PA consider solar panels as impervious cover. Currently, we are not aware of any studies proving either side.

Model Language

The following example is a summary of model zoning language from the model ordinance for energy projects written by the Oregon Department of Energy:

Use: A Solar Energy Production Facility shall be considered a permitted use in the industrial and commercial zones, and a special exception use in the agricultural district.

Acreage: The proposed solar energy project would occupy less than [ ] acres on land zoned for commercial or industrial use or for agricultural zoning districts less than [ ] acres on land zoned for agricultural use.

Height and Setback: For purposes of determining compliance with lot coverage standards of the underlying zone, the total surface area of all ground-mounted and freestanding solar collectors including

solar photovoltaic cells, panels, arrays, and solar hot air or water collector devices shall be considered impervious. Panels mounted on the roof of any building shall be subject to the maximum height regulations specified within each the underlying zone.

Design and Installation:

- All on-site utility and transmission lines shall, to the extent feasible, be placed underground.
- All large solar energy production facilities shall be designed and located in order to prevent reflective glare toward any inhabited buildings on adjacent properties as well as adjacent street rights-of-way.
- A clearly visible warning sign concerning voltage must be placed at the base of all pad-mounted transformers and substations.
- The proposed solar energy project is not located adjacent to, or within, the control zone of any airport.
- Whenever practical, all principal solar energy systems should be attached to a building; or if ground mounted and/or freestanding, the applicant shall demonstrate by credible evidence that 1) the area proposed for the principal solar energy system does not predominantly consist of Class I, II and/or III soils, as identified in the soil survey, and is generally unsuitable for agricultural purposes: and 2)such facilities cannot feasibly be attached to a building due to structural limitations of the building.
- All mechanical equipment of principal solar energy systems including any structure for batteries or storage cells, shall be completely enclosed by a minimum eight (8) foot high fence with a self-locking gate, and provided with screening in accordance with the landscaping provisions of the municipal subdivision and land development ordinance.

Use of Public Roads: The applicant has secured, or can secure, all necessary approvals from the local government or the State Highway Division of access points for project roads and parking areas at the project site.

Liability Insurance: There shall be maintained a current general liability policy covering bodily injury and property damage with limits of at least $1 million per occurrence and $1 million in the aggregate.

Decommissioning: The applicant agrees to the following as conditions of the land use permit:

- If the applicant ceases operation of the energy project or begins, but does not complete, construction of the project, the applicant shall restore the site according to a plan approved by the planning authority.
- The Large Solar Energy Production Facility owner is required to notify the [*municipality*] immediately upon cessation or abandonment of the operation. The owner shall be responsible for the removal of the facility within six (6) months from the date the applicant ceases use of the facility or the facility becomes obsolete. The owner shall then have twelve (12) months in which to dismantle and remove the Large Solar Energy Production Facility from the property. At the time of issuance of the permit for the construction of the Large Solar Energy Production Facility, the owner shall provide financial security in form and amount acceptable to the [*municipality*] to secure the expense of dismantling and removing said structures.

City of Grosse Pointe Woods
BUILDING DEPARTMENT
Monthly Financial Report – September 2011

Permits Issued:	125		
Rental Certificates:	9	Total Amount:	$ 17,384
Vacant/Foreclosure:	5		

CODE ENFORCEMENT

Abandoned/Foreclosure Compl. Notices Issued:	2
# of Complaints Investigated by Code Enforcement:	25
Closed Due to Compliance:	19
Open for Longer Compliance Time:	6
Citations Issued:	71
Early Trash Notices:	3
Code Violation Notices to Residents:	11
Tall Grass Notices Issued:	40
Stop Work notices to Contractors (working w/o permit):	13
Outside Storage:	4

NEW BUSINESS

Galeria Mariposa, 20445 Mack (April)
Alternative Gynecology, 19557 Mack (June)
Colleen Dyer/State Farm, 20879 Mack (July)