Zoning for Solar and Wind Energy Systems

Regulating rooftop solar energy systems is not generally recommended. However, Pennsylvania municipalities may adopt zoning regulations to govern the installation and operation of them as well as other types of solar and wind energy systems. This guide specifically addresses rooftop solar; non-commercial, ground-mounted solar; and non-commercial wind energy systems.

Regulating rooftop solar energy systems without compelling cause is not recommended; readers are encouraged to review the guide *Don't Regulate Rooftop Solar Without Compelling Cause* before delving into this guide. With that said, Pennsylvania municipalities may adopt zoning regulations to govern the installation and operation of rooftop solar as well as other types of solar and wind energy systems

This guide addresses rooftop solar; non-commercial, ground-mounted solar; and non-commercial wind energy systems. In the interest of brevity, these systems are hereafter referred to as "solar and wind energy systems."

This guide does not address zoning for wind and ground-mounted solar systems whose primary purpose is to generate energy for use off-site (i.e., commercial-scale systems); however, it is advisable for municipalities to address such uses in their zoning ordinances. Commercial-scale renewable energy systems must be allowed in one or more locations in order to avoid an exclusionary zoning challenge.

Tips to Improve the Amendment Process

The vast majority of municipalities that regulate renewable energy systems do so by amending their existing zoning ordinances to include specific provisions addressing renewable energy systems. Often, this requires revising multiple sections of the zoning ordinance. The following tips can improve the process of drafting provisions and amending a zoning ordinance.

Ask Preliminary Questions

These questions identify issues that may arise while establishing zoning regulations for solar and wind energy systems; they have arisen in similar ordinance-development efforts and are provided to help develop a working outline of the draft regulations:

- Should local regulations limit how much solar or wind energy can be generated in a non-commercial setting?
- What will be the maximum height allowed for wind turbines? How much of a minimum setback from buildings and property lines is needed? Are there potential noise impacts?
- Will the municipality involve itself in protecting landowners' solar access by requiring solar access easements?
- How should the abandonment of solar or wind energy systems be addressed?
- Should solar or wind energy systems be regulated differently when located within an established historic district? If so, how?

Establish a Task Force

Establishing a task force comprised of local officials, landowners, renewable energy professionals, interested residents, and other stakeholders can help municipalities create balanced and effective zoning regulations while involving the community. A task force can do things like research current best practices and consult other municipalities about how they address non-commercial solar and wind systems. Ideally, a task force will help ensure that everyone is on the same page before the new zoning provisions are adopted, preventing future conflict.

Consult Professionals

A municipality can benefit greatly from hiring a professional planning consultant and renewable energy experts to draft the zoning regulations, manage the task force, and ensure legal compliance. The municipality's solicitor is also a valuable resource for legal guidance.

Educate the Public

Informational meetings, newspaper articles, and updates on the municipal website and social media accounts are crucial to inform the public, gather feedback, and build support for the proposed changes before they take effect.

Seek Funding

Investigate whether county, state, or federal grants could help cover costs incurred to develop renewable energy zoning regulations. Since solar and wind energy systems help reduce greenhouse gas emissions, the supporting zoning revisions may be eligible for U.S. Department of Energy funds distributed to Pennsylvania municipalities.

Visit these websites to learn more:

- Pennsylvania State Energy Program (Department of Environmental Protection)
- Energy Efficiency and Renewable Energy Funding Opportunities (U.S. Department of Energy)

Expect Revisions

Even the best zoning ordinances cannot predict all extenuating circumstances that a municipality may face on any given renewable energy project proposal, especially with advances in technology. Future revisions to the ordinance may be necessary.

Ordinance Provisions

Statement of Purpose

It is recommended that the zoning ordinance include a supporting statement of purpose or specific community development objective in order to establish a foundation for the regulation of renewable energy systems. If the municipality has adopted a comprehensive plan, the statement or objective can refer to the plan's goals or policies regarding renewable energy.

Definitions

The meanings of new terms used in any new regulations should be included in the zoning ordinance's definitions chapter or article. Definitions routinely used by Pennsylvania municipalities in their zoning ordinances include:

Solar Access. The access of a solar energy system to direct sunlight.

Solar Easement. An easement that protects access to sunlight on a property.

Solar Energy System. Any solar collector panel(s), film(s), shingle(s), or other solar energy device(s), or solar structural component(s), mounted on a building or on the ground and including other appurtenant structures and facilities, whose primary purpose is to provide for the collection, storage, and distribution of solar, or radiant, energy received from the sun and used for heating or cooling, water heating, or generation of electricity. A solar energy system may be ground-mounted (i.e., placed on top of the ground surface) or roof-mounted (i.e., placed on or as an integral part of a building).

Utility-Scale Renewable Energy System. Any commercial-scale solar or wind energy system (i.e., the system is the principal use on the property and its operator has signed an official agreement of power purchase with a utility provider, or it produces energy in excess of 125% of the energy needed by the property's principal use).

Wind Energy System. Any electric generation facility whose main purpose is to convert and store wind energy into usable forms of energy; this includes the wind turbine(s), structural supports, electrical infrastructure, and other appurtenant structures and facilities. A wind energy system may be freestanding (i.e., placed on top of the ground surface) or roof-mounted (i.e., placed on or as an integral part of a building).

Permitting Renewable Energy Systems as Accessory Uses

To permit solar and wind energy systems as accessory uses, the proposed zoning regulations should clearly state that the systems are permitted as accessory uses to permitted principal uses, subject to any applicable zoning regulations. This can be accomplished in either of two ways:

- Add solar and wind energy systems to the list of accessory uses permitted in every zoning district (this list is often found in the ordinance's general regulations); or
- Add solar and wind energy systems to the list of permitted accessory uses in one or more of the existing base zoning districts.

The second option is usually preferred because it allows a municipality to regulate renewable energy systems differently in different districts. The permitted uses in each base zoning district are usually divided into uses permitted by right (ministerial approvals) and uses permitted by special exception or conditional use (discretionary approvals).

Permitted by Right

When an accessory use is permitted by right, the decision of whether or not to approve it lies with a municipal official (usually a zoning officer). The official must approve a requested use if it is permitted by the zoning ordinance and complies with all applicable zoning ordinance provisions. For example, if non-commercial solar energy systems are permitted by right in a residential district, the municipality must approve a permit to install solar panels on a rooftop as long as the applicant demonstrates that the panels are accessory to a principal use, will meet all applicable zoning ordinance provisions, and will comply with any applicable performance standards.

Pennsylvania zoning law prevents the official granting the permit from attaching any conditions of approval not otherwise specified within the zoning ordinance. Also, the zoning ordinance language must allow for simple "yes it complies" or "no it does not comply" determinations and avoid gray-area interpretations. Input by any adjacent property owners has no legal relevance to the permit-issuance determination.[1]

Permitted by Special Exception or Conditional Use

Discretionary approvals involve a longer and potentially more expensive review process. They are divided into two categories:

- Special exception permits (the decision to approve or deny a proposal is made by a zoning hearing board).
- Conditional use permits (the decision is made by the municipality's governing body).

For both types of permits, the decision-making body considers all relevant information, takes public testimony, reviews the zoning ordinance and other applicable documents, and ultimately decides whether or not to approve a given use. Unlike with ministerial approves, the body *can* impose conditions on an approval in order to mitigate problems identified during the review process.

The zoning ordinance text must specify the need for either a special exception or conditional use permit, and must include any procedural requirements for obtaining discretionary approval. In most cases, municipalities charge application fees for discretionary approvals, and application decisions can take several months.

The special exception option often works better for solar and wind energy systems because it avoids involving municipal elected officials in relatively minor use approvals. (The conditional use option would

[1] The only exception is if an adjoining landowner or tenant has filed a complaint with the municipality over a possible ordinance violation on a pre-existing situation and a resolution is still pending.

likely be more appropriate for commercial-scale energy systems.)

Combining Options

Some municipalities combine options depending on the type of energy system, location, and site characteristics. For example, a municipality might permit by right solar arrays in residential zoning districts but require special exception approval for solar arrays in a historic district.

Prohibited Uses

A municipality may completely prohibit non-commercial solar or wind energy systems in one or more zoning districts, provided that they are permitted in at least one district. The opinion of the municipal solicitor should always be consulted before enacting such prohibitions.

Location and Height Restrictions

Location

The proposed zoning regulations should differentiate between ground-mounted and roof-mounted energy systems. In addition to addressing spacing concerns for higher-density residential and other uses, ground-mounted systems should be required to comply with minimum yard or setback requirements for accessory structures. The regulations may also require a ground-mounted solar collector to be located behind the building line, or to the side or rear of the principal use or structure (this is more common in residential zoning districts where residents may object to ground-mounted collectors in a front yard).

For safety purposes, the minimum required setback for a ground-mounted wind turbine might directly correspond to the proposed height of the turbine. For example, a 100-foot wind turbine could require a minimum setback of 100 feet from all property lines so that no part of the turbine would encroach upon an adjoining lot or parcel if it were to fall or be lowered for maintenance.

Zoning restrictions may also prevent roof-mounted systems from hanging over roof edges. Some municipalities require roof-mounted systems to be set back at least three feet from the roof edge to allow access by firefighters or other personnel.

Height

The height of ground-mounted solar arrays may be limited by maximum height limitations within a zoning ordinance (either the same maximum-height limitation applied to all accessory structures or by a separate provision). Roof-mounted solar panels are often permitted to slightly exceed the building height limitation for the principal structure; this extra allowance provides for roofs already constructed at the maximum height limit allowed. Regulations also typically set a maximum height limit for solar panels.

Like radio towers and grain silos, wind turbines may be exempted from complying with the maximum height limitation that applies to principal structures. However, it would be appropriate for a municipality to establish a maximum height limitation for wind turbines (e.g., 150 feet), or have more than one maximum height limitation depending on the character of the surrounding landscape. A more densely developed residential area might have a 75-foot height limit for wind turbines, while an agricultural area might allow twice that height. The ordinance should also define how the maximum height limitation is measured (e.g., from the base of the pole at average ground level to the highest blade tip of the turbine).

Variances

Like all other uses subject to a municipal zoning ordinance, applicants for solar or wind energy systems unable to comply with an ordinance's locational requirements due to unique circumstances (such as a steeply sloping yard) may seek a variance for relief from such requirements. A municipality's zoning hearing board may issue a variance if, after a review process and public hearing, it makes the findings outlined in §910.2 of the Pennsylvania Municipalities Planning Code.

Performance Standards

Performance standards (sometimes referred to as supplemental regulations) are typically included in zoning ordinances to address potential impacts of a solar or wind energy system. Unlike general regulations, performance standards can be tailored to a specific use or a base district's area and bulk regulations. This section offers sample standards that apply

to both solar and wind energy systems, as well as standards specific to each.

Sample Standards for All Renewable Energy Systems

- Systems must conform to Pennsylvania Uniform Construction Code and industry standards, as applicable.
- Advertising and other signage is prohibited, except for danger signs and information regarding energy generation.
- Electrical wires must be placed underground or in appropriately sized and colored conduits where aboveground.
- Systems must be disassembled and sites restored after a period of inactivity [*typically one year*].

Sample Standards for Solar Energy Systems

- Solar energy systems of a certain size are exempt due to their minimal impact [*e.g., sidewalk-level landscape lighting*].
- Ground-mounted solar systems may not exceed an established maximum height [*typically 12–15 feet*].
- Roof-mounted solar panels or solar water heaters must be set back from the edge of the roof to allow access to firefighters and other emergency personnel [*typically three feet*].

Sample Performance Standards for Wind Energy Systems

- Wind energy systems may not exceed an established noise threshold [*typically 55 decibels*].
- Wind energy systems may not exceed adequate setbacks [*typically equal to the height of the turbine*] from property lines, structures, and rights-of-way; such setbacks insure adequate clear area for the turbine to be laid flat.
- Turbines that disrupt radio, television, and other communications are prohibited.
- Safety fencing around the base of the turbine is required.

Solar Access

Municipalities may address solar-access issues by including zoning provisions that allow landowners to obtain and maintain solar rights, usually via a solar access easement. This is especially important in higher-density or older zoning districts where buildings or tall vegetation could inhibit solar access.

See §5301.63 of Ohio code for an outline of typical solar access easement terms. See *A Comprehensive Review of Solar Access Law in the United States* and *Model Solar Energy Access* Legislation for more detailed information about solar-access law.

Historic Buildings and Sites

A municipality may choose from a variety of regulations to protect historic buildings and sites. For example, the ordinance establishing a historic district could require that any renewable energy systems proposed for sites within the district be reviewed by the district's historic architectural review board. As discussed previously, municipalities can also protect historic resources via the discretionary-approval process or performance standards. *Design Guidelines for Solar Installations*, published by the National Trust for Historic Preservation, outlines best practices for solar energy installations on historic buildings and sites.

Additional Resources

The ConservationTools.org page Zoning for Solar and Wind Systems contains a wealth of relevant resources. See the subsections "Sample Solar and Wind Ordinances" and "Model Solar and Wind Ordinances" for sample and model ordinances from Pennsylvania and around the United States.

The guide *Renewable Energy Ordinance Framework: Solar PV*, published by the Delaware Valley Regional Planning Commission, is a particularly valuable resource for municipalities seeking to develop or update zoning ordinances related to solar energy systems.

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