

Model Solar Ordinances

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California County Planning Directors Association

Model Solar Energy Facility Permit Streamlining Ordinance

Appendix A

to

Model Solar Energy Facility Permit Streamlining Guide

February 3, 2012

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**AN ORDINANCE AMENDING ORDINANCE NO. _____ OF THE
COUNTY CODE OF (_____) TO PROVIDE FOR THE PERMITTING
OF SOLAR ENERGY FACILITIES**

1. DEFINITIONS

- A. "Applicant" is the Landowner, developer, facility owner, and/or operator with legal control of the project, including heirs, successors and assigns, who has filed an application for development of a Solar Energy Facility under this Ordinance.
- B. "Parcel" means all land within a legally established parcel.
- C. "Practicable" means it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.
- D. "Landowner" means the persons or entities possessing legal title to the Parcel(s) upon which a SEF is located.
- E. "Protected Lands" means, for the purpose of this chapter only, lands containing resources that are protected or regulated by established regulatory standards of local, state, and federal agencies, conservation easements or other contractual instruments in such a way that prohibits or limits development of those lands.
- F. "Review Authority" means applicable county or city land use decision-making body as determined by local ordinance and appeal procedures.
- G. "Solar Energy Facility (SEF)" means a Solar Electric System that satisfies the parameters set out in Tiers 1 through 3 below.
- H. "Solar Electric System (SES)" means the components and subsystems that, in combination, convert solar energy into electric or thermal energy suitable for use, and may include other appurtenant structures and facilities. The term includes, but is not limited to, photovoltaic power systems, solar thermal systems, and solar hot water systems.
- I. "Renewable Energy Combining Zone" means a zoning district that may be combined with other base zoning and applied to specific geographic areas within the County, where the County has determined the land is suitable for a specified variety of Solar Energy Facilities and where permitting for such facilities may be expedited if specified conditions are met.
- O. "Uses Allowed" means one of the following:
 - i. Accessory Use – a SEF designed primarily for serving on-site needs or a use that is related to the Primary Use of the property.
 - ii. Direct Use – a SEF designed and installed to provide on-site energy demand for any legally established use of the property.

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- iii. Primary Use – a SEF that uses over 50% of the Parcel(s) and is devoted to solar electric power generation primarily for use off-site.
 - iv. Secondary Incidental Use – a SEF that provides up to 125% of on-site electricity (or hot water) demand and generally less than 50% of the building site area, or 15-25% of the Parcel land area.
 - v. Secondary Use – a SEF that is not the Primary Use of the property and uses less than 50% of the Parcel(s).
- P.** “Williamson Act Contracted Parcel” means a Parcel of land that is in contract with a local authority for the preservation of agricultural and open space land per the Land Conservation Act of 1965 or similar local agricultural land preservation programs.

2. PURPOSE

The purpose of the Ordinance is to facilitate the construction, installation and operation of a Solar Energy Facilities (SEFs) in the County of (_____) in a manner that protects public health, safety and welfare and avoids significant impacts to protected resources such as important agricultural lands, endangered species, high value biological habitats and other protected resources. It is the intent of this ordinance to encourage solar facilities that reduce reliance on foreign petroleum supplies, increase local economic development and job creation, reduce greenhouse gas emissions, assist California in meeting its Renewable Portfolio Standards, and/or promote economic development diversification.

3. APPLICABILITY

- A.** This Ordinance applies to the construction of any new SEF within the County.
- B.** A SEF legally established or permitted prior to the effective date of this Ordinance shall not be required to meet the requirements of this Ordinance, however:
 - i. Physical modification or alteration to an existing SEF that materially alters the size, type or components of the SEF shall be subject to this Ordinance. Only the modification or alteration is subject to this Ordinance;
 - ii. Substantial conformance review determinations are not major amendments to a project's existing permits; and
 - iii. Routine operation and maintenance or like-kind replacements do not require a permit.

4. PERMIT REQUIREMENTS

The type of permit required for SEFs shall be as shown in Table 1 Permit Requirements (see following page).

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Table 1. Permit Requirements

LAND USE/ZONING DISTRICT	Prime - WA	Non-prime - WA	Prime, Statewide, or Unique Farmland	Land Extensive Ag Non-prime or Grazing	Resource Lands	Timber Production	Renewable Energy Overlay Zone	Public Facilities	Industrial or Heavy Commercial	Industrial, Office or Business Park	General Commercial	Neighborhood Commercial	Foothill & Rural Residential 10+ ac	Rural Residential: 5 - 10 ac	Rural Residential: < 5 ac	Urban Residential	STANDARDS OR SPECIAL USE REGULATIONS	
UTILITY & RESOURCE-BASED USES																		
Solar Energy Facilities (PV)																	Health & Safety Standards	
Direct Use																		
On structures	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
Ground-mounted up to 1/2 acre	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
Accessory Use																	General Development Standards	
<15% of parcel up to 5 ac whichever is less	AP ¹	AP ¹	AP	AP	AP ¹	AP	AP	AP	AP	AP	AP	AP	AP	AP	AP	AP		—
<15% of parcel up to 10 ac whichever is less	—	AP ¹	AP	AP	AP ¹	AP	AP	AP	AP	AP	AP	—	AP	AP	AP	AP		—
Secondary Use																		
< 30% of parcel up to 7 ac	MUP ¹	MUP ¹	AP ²	AP ²	AP ¹	AP	AP	AP	AP	AP	AP	—	AP	MUP	MUP	—		
< 30% of parcel up to 10 ac	MUP ¹	MUP ¹	MUP ²	AP ²	AP ¹	AP	AP	AP	AP	MUP	AP	—	MUP	—	—	—		
< 30% of parcel up to 20 ac	—	MUP ¹	CUP ³	MUP ²	AP ¹	MUP	AP	AP	AP	CUP	AP	—	CUP	—	—	—		
Primary Use																		
up to 15 ac	—	—	CUP ³	MUP ²	MUP ¹	CUP	AP	AP	AP	CUP	AP	—	—	—	—	—		
up to 20 ac	—	—	CUP ³	MUP ²	MUP ¹	—	AP	AP	AP	—	AP	—	—	—	—	—		
up to 30 acres	—	—	CUP ³	CUP ²	CUP ¹	—	MUP	MUP	MUP	—	MUP	—	—	—	—	—		
exceeds thresholds above	—	—	CUP ³	CUP ²	CUP ¹	—	CUP	CUP	CUP	—	CUP	—	—	—	—	—		
Notes:																		
1. If under a Land Conservation Act (Williamson Act) contract, the facility must be listed as compatible use in the locally adopted Ag Preserve Rules; allowed by the type of contract; and, no more than 15% of the parcel up to 5 acres under prime contracted lands or up to 10 acres if under a non-prime contract or designated as grazing lands, unless findings are made by the Board of Supervisors that a larger site area meets the principles of compatibility in Gov. Code Section 51238.1																		
2. Not on land under Land Conservation Act (Williamson Act) contract.																		
3. Not allowed except when included in Renewable Energy Combining Zone																		
TYPE OF PERMIT REQUIRED																		
Tier 1	P	Permitted Use - Ministerial; CEQA Exempt; Building Permit Only																
Tier 2	AP	Administrative Permit - Ministerial w/standards; CEQA exempt; no added conditions																
Tier 3	MUP	Minor Use Permit - Zoning Administrator or staff approval; noticed hearing; maybe CEQA exempt; can add conditions																
Tier 4	CUP	Conditional Use Permit - noticed hearing before Planning Commission; CEQA review; can add conditions																
	—	Not allowed																

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The following setbacks from the Parcel line to the closest part of the SEF shall be established as shown in Table 2. Fencing, roads and landscaping may occur within the setback. (Each County will need to establish their own setback requirements - the following table is intended to assist in this effort).

Table 2. Parcel Line Setbacks					
Zoning District	Tier 1	Tier 2	Tier 3		
			Front	Rear	Side
Ag Zone *	Per Zoning for that District	Per Zoning for that District	30'	30'	30'
Commercial *			30'	30'	30'
Industrial *			30'	30'	30'
Rural Residential (> 10 acres)			100'	100'	100'
Residential (<10 acres)			Per Zoning for that District		
* Complies with required front yard setbacks, or otherwise does not impair sight distance for safe access to or from the property or other properties in the vicinity as determined by ministerial zoning clearance.					

6. HEIGHT LIMITS

For ground mounted systems, height restrictions will be measured from natural grade below each module in the event the site has topographic changes. (Each County will need to establish their own height limits – Table 3 is intended to assist in this effort).

Table 3. Height Limits			
Zoning District	Tier 1	Tier 2	Tier 3
Ag or Rural Residential	Roof – 2' above roof surface Ground – 15'	Roof – 2' above roof surface and may project above the height limit Ground – 15'	Roof – 2' above roof surface and may project above the height limit Ground – 15-25'
Commercial or Industrial	Roof – 4' above roof surface and may project above the height limit Ground – 15'	Roof – 4' above roof surface and may project above the height limit Ground – 15'	Roof – 4' above roof surface and may project above the height limit Ground – 15-25'
Residential	Roof – 2' above roof surface and may project above the height limit Ground – 10'	Roof – 2' above roof surface and may project above the height limit Ground – 10'	Roof – 2' above roof surface and may project above the height limit Ground – 15'

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7. GENERAL REQUIREMENTS (apply to all tiers unless otherwise noted)**A. Building Permits Are Required –**

- a. Nothing in this chapter modifies the minimum building standards required to construct a SEF, consistent with applicable building and fire codes. The SEF components and all accessory equipment shall comply with the most recently adopted Building Code as determined by the Building Official and Fire Code as determined by the Fire Official.
- b. A site plan shall be provided at the time of the Building Permit application demonstrating compliance with the setbacks in Tables 1 and 2.
- c. The Building Permit shall include review by local permitting departments including, but not limited to, the local Fire Authority, for Health and Safety Requirements.

B. Right To Farm – If the SEF is located on or adjacent to an agricultural zone, the Applicant must acknowledge the County's Right to Farm Ordinance and shall be required to record a Right to Farm Notice on their Parcel(s) prior to issuance of any Building Permits. This shall be included as a recommended condition of approval of the land use entitlement if a discretionary permit is required.

C. Off-Site Facilities – When the SEF is located on more than one Parcel, there shall be proper easement agreement or other approved methods for the notification of all impacted parties.

D. Septic System Avoidance – The SEF shall not be located over a septic system, leach field area or identified reserve area unless approved by the Department of Environmental Health;

E. Floodplain Avoidance – If located in a floodplain as designated by FEMA, or an area of known localized flooding, all panels, electrical wiring, automatic transfer switches, inverters, etc. shall be located above the base flood elevation; and, shall not otherwise create a fire or other safety hazard as determined by the Building Official.

F. Conform to Development Standards for Underlying Zone – The SEF shall be ground mounted, or when located on structures, the SEF shall conform to the development standards for a principal structure in the zone in which such facilities and structures are to be located, except as otherwise provided herein;

G. Visibility

- a. Scenic Areas – For Tier 2 and 3 SEFs in Scenic areas, as designated in the General Plan, efforts shall be made by the Applicant, to the maximum extent practicable, to shield the SEF

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from public view. On-site power lines shall, to the maximum extent practicable, be placed out of sight or underground.

- b. All Areas - Additionally, all ground mounted facilities shall:
 - i. If lighting is required, it shall be activated by motion sensors, fully shielded and downcast type where the light does not spill onto the adjacent Parcel or the night sky;
 - ii. Not display advertising, except for reasonable identification of the panel, inverter or other equipment manufacturer, and the facility owner;
 - iii. Be sited behind existing vegetation (which shall be supplemented with landscaping where not adequate to screen the project) or be sited using the natural topography to screen the project; and
 - iv. Be enclosed by a fence, barrier, barbwire, razor wire or other appropriate means to prevent or restrict unauthorized persons or vehicles from entering the Parcel(s). Fences or barriers shall incorporate wildlife friendly design. No barrier shall be required where projects employ full-time security guards or video surveillance.

H. Locations Requiring Discretionary Review – The following principles shall apply to the Review of Tier 3 locations: No portion of the SEF or their structures shall occupy Protected Lands, unless specifically evaluated under CEQA and permitted. Protected Lands that are potentially incompatible locations, requiring Tier 3 permits, include:

- a. Floodways.
- b. Wetlands, wetland transition areas, riparian corridors, or open water.
- c. In agricultural zones, project sites designated under the Department of Conservation Farmland Mapping and Monitoring Program's Division of Land Resource Protection map as "Prime Farmland", "Farmland of Statewide Importance" and "Unique Farmland".
- d. Lands subject to Williamson Act Contracts that disallow the SEF per principles of compatibility per Government Code 51201 (e), 51238, 51238.1 and 51238.3.
- e. Habitat of special status, threatened, endangered, candidate, or fully protected species, species of special concern, or species protected under the Native Plant Protection Act; Environmentally Sensitive Habitat Areas, important habitat/wildlife linkages or areas of connectivity; and areas covered by Habitat Conservation Plans

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or Natural Community Conservation Plans that preclude development.

f. Lands within easements where SEF is a prohibited use.

I. Abandonment – A SEF, other than a Tier 1 system, that ceases to produce electricity on a continuous basis for twenty four (24) months shall be considered abandoned unless the Applicant or Landowner demonstrates by substantial evidence satisfactory to the County Planning/Development Services Department that there is no intent to abandon the facility. Applicants and/or Landowners are required to remove all equipment and facilities and restore the site to original condition upon abandonment.

- i. Facilities deemed by the County to be unsafe and facilities erected in violation of this section shall also be subject to this Section. The code enforcement officer or any other employee of the Planning, Building and Public Works Departments shall have the right to request documentation and/or affidavits from the Applicant regarding the system's usage, and shall make a determination as to the date of abandonment or the date on which other violation(s) occurred.
- ii. Upon a determination of abandonment or other violation(s), the County shall send a notice hereof to the Applicant and/or Landowner, indicating that the responsible party shall remove the SEF and all associated facilities, and remediate the site to its approximate original condition within ninety (90) days of notice by the County, unless the County determines that the facilities must be removed in a shorter period to protect public safety. Alternatively, if the violation(s) can be addressed by means short of removing the SEF and restoration of the site, the County may advise the Applicant and/or Landowner of such alternative means of resolving the violation(s).
- iii. If the Applicant and/or Landowner do not comply, the County may remove the SEF and restore the site and may thereafter (a) draw funds from any bond, security or financial assurance that may have been provided or (b) initiate judicial proceedings or take other steps authorized by law against the responsible parties to recover only those costs associated with the removal of structures deemed a public hazard.

8. SOLAR ENERGY FACILITIES – TIER 1

A. General Requirements. Tier 1 Solar Energy Facilities are ground mounted SEFs that provide energy primarily for on-site use, or rooftop systems that provide energy for any use, that are permitted as Accessory Uses in all zone districts within the County as shown in Table 1. Rooftops or ground mounted systems covering developed parking areas or other hardscape areas are encouraged as preferred locations for a SEF. In addition to the General

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Requirements in Section 7, the following standards shall apply to all Tier 1 SEFs, notwithstanding the development standards for the underlying zone:

- i. Tiers Table 1 – Meet the size thresholds for a ministerial permit in Table 1;
- ii. Lot Coverage – Rooftop systems can be any size, ground mounted systems may not exceed ½ an acre;
- iii. Setbacks – Ground mounted structures shall conform to the setbacks as shown in Table 2. For front yard setbacks, the Applicant may show that the SEF otherwise does not impair sight distance for safe access to or from the property or other properties in the vicinity as determined by ministerial zoning clearance; and
- iv. Height Limits – Facilities shall conform to the height limits of Table 3, unless demonstrated by a structural engineer to meet public safety standards.
- v. Floodway - A Tier 1 SEF shall not be located in a Floodway unless evaluated under a discretionary process.

9. SOLAR ENERGY FACILITIES – TIER 2

A. General Requirements. Tier 2 SEFs provide energy for on-site or off-site use and are permitted as secondary and incidental uses as shown in Table 1. In addition to the General Requirements in Section 7, the following standards shall apply to all Tier 2 SEF, notwithstanding the development standards for the underlying zone:

- i. Tiers Table 1 – Meet the size thresholds for an administrative permit in the applicable zoning district as shown in Table 1;
- ii. Lot Coverage – Allowable lot coverage varies by zoning district as shown in Table 1;
- iii. Setbacks – Ground mounted structures shall conform to the setbacks as shown in Table 2. For front yard setbacks, the Applicant may show that the SEF otherwise does not impair sight distance for safe access to or from the property or other properties in the vicinity as determined by ministerial zoning clearance.
- iv. Height Limits – Facilities shall conform to the height limits of Table 3.
- v. Floodway - A Tier 2 SEF shall not be located in a Floodway unless evaluated under a discretionary process.

B. Agricultural Resources – Tier 2 SEF facilities shall be sited to avoid important farmlands as mapped by the state department of conservation including prime, farmlands of statewide importance, unique or locally important farmlands, unless determined by the review authority in consultation with the Agricultural

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Commissioner to be chemically or physically impaired, except for an SEF on less than 15% of the Parcel(s).

- i. Williamson Act – Tier 2 SEF are allowed on Williamson Act contracted land only if determined to be a compatible use. The SEF must be listed as a compatible use in the local Williamson Act Rules. The total site area for all compatible uses, including renewable energy facilities, should not be greater than 15 percent of the Parcel(s) or 5 acres, whichever is less, if located on prime land or 30 percent of the Parcel(s) or up to 10 acres if located on non-prime land, unless determined by the legislative body in consultation with the Agricultural Commissioner and/or the appointed advisory body that a larger site area is consistent with the principles of compatibility in conformance with Government Code Section 51238.1.

C. Biological Resources – Tier 2 SEF shall not be located on lands which support listed, candidate or other fully protected species, species of species concern, or species protected under the Native Plant Protection Act; Environmentally Sensitive Habitat Areas; or provide important habitat linkage or connectivity on a landscape or regional scale as designated in a General Plan, Area or Specific Plan or as identified in the California Natural Diversity Database. If a proposed Tier 2 SEF project is located on such land, it shall require a minor or conditional use permit as determined by the director.

10. SOLAR ENERGY FACILITIES – TIER 3

A. General Requirements. Tier 3 facilities are allowed as Secondary or Primary Uses that provide energy for on-site or off-site use as shown in Table 1 subject to a minor use permit, CEQA review and approval by a Zoning Administrator or other similar administrative approval process. In addition to the General Requirements in Section 7, the following standards shall apply to all Tier 3 SEF, notwithstanding the development standards for the underlying zone:

- i. Tiers Table 1 – Meet the size thresholds for a minor use permit in the applicable zoning district as shown in Table 1;
- ii. Lot Coverage – Allowable lot coverage varies by zoning district as shown in Table 1;
- iii. Setbacks – Ground mounted structures shall conform to the setbacks as shown in Table 2 and whenever an SEF abuts an agricultural operation or agricultural zone, an agricultural buffer on the SEF Parcel shall be established at a minimum of 100 feet. The buffer may be reduced if the decision-making body determines that there is a substantial screen such as existing topography or landscaping vegetation and/or an operational management plan and/or an agricultural operation easement is provided;
- iv. Height Limits – Facilities shall conform to the height limits of Table 3;

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B. Agricultural Resources – The preservation of agricultural activities and agriculturally viable soils is an important consideration. Therefore:

- i. Farmland Protection - Tier 3 SEF projects shall limit the amount of disturbance to Prime Farmland, Farmland of Statewide Importance, Unique Farmland and Locally Important agricultural lands to the highest extent possible and consistent with local agricultural preservation requirements, unless determined by the review authority, in consultation with the Agricultural Commissioner, to be chemically or physically impaired.
- ii. Grading - Grading within Prime Farmland, Farmland of Statewide Importance, Unique Farmland shall be limited to only that necessary to construct access roads and install equipment, unless the areas are determined to be chemically or physically impaired.
- iii. Agricultural Preserves – If the facility is located on a site under a Williamson Act contract, the facility must be listed as a compatible use in the local Agricultural Preserve Rules, allowed by the type of contract, and findings must be made by the review authority in consultation with the Agricultural Commissioner and/or the appointed advisory body that the SEF is consistent with the principles of compatibility in conformance with Government Code Section 51238.1 or the contract must be otherwise terminated in accordance with existing law.

C. Biological Resources – The protection of high value biological resources is an important consideration. Tier 3 SEF projects shall not be located on lands that support listed, candidate or other fully protected species, species of special concern, or species protected by the Native Plant Protection Act; Environmentally Sensitive Habitat Areas; or provide important habitat linkage or connectivity on a landscape or regional scale as designated in a General Plan. If a proposed Tier 3 SEF project is located on such land, it may be directed for hearing to the Planning Commission. Applicants are encouraged to coordinate with permitting agencies such as Dept. of Fish and Game and U.S. Fish and Wildlife Service during design stages.

D. Soil Stabilization, Erosion Control and Ground Water Management – For Tier 3 SEFs, the following requirements shall apply:

- i. To the extent feasible and compatible with the climate and pre-project landscaping of the property the site shall be restored with native vegetation. The re-vegetation plans shall be reviewed and approved by the County Planning and Fire Departments. All areas occupied by the facility that are not utilized for access to operate and maintain the installation shall be planted and maintained with a native shade tolerant grass or other vegetation for the purpose of soil stabilization or other methods approved by the Planning Department.

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- ii. A storm water management plan showing existing and proposed grading and drainage demonstrating no net increase in runoff shall be provided subject to approval by the review authority.
- iii. A maintenance plan shall be submitted for the continuing maintenance of the SEF, which may include, but not be limited to, planned maintenance of vegetation or ground cover, equipment maintenance, and plans for cleaning of solar panels if required.
- iv. Prior to issuing a final Building Permit, an as-built grading and drainage plan, prepared by a licensed professional surveyor or other approved qualified professional shall be submitted to the reviewing agency's engineer for review and approval. The plan shall show that the as-built conditions are substantially the same as those shown on the approved grading and drainage plan.

11. SOLAR ENERGY FACILITIES – TIER 4

- A. Facilities that exceed the size thresholds or do not meet the standards for Tiers 1-3 shall be considered Tier 4 facilities. Tier 4 facilities are allowed as Secondary or Primary Uses that provide energy for on-site or off-site use as shown in Table 1 subject to a Conditional Use Permit, CEQA review, public hearing and approval by the Planning Commission and/or Board of Supervisors. Conditions of approval may be added through the Conditional Use Permit review process.



Renewable Energy Combining Zone

Appendix B

to

Model Solar Energy Facility Permit Streamlining Guide

February 3, 2012

<http://www.ccpda.org>

RENEWABLE ENERGY COMBINING ZONE

A. Purpose

To encourage and facilitate development of large-scale renewable energy facilities in appropriate areas based on the availability of renewable resources, the location of existing or planned infrastructure, and the potential for renewable energy facilities to be appropriately sited and to effectively mitigate potential significant impacts.

B. Applicability

The Renewable Energy Combining Zone may be applied only within the following primary zoning districts:

1. Land Extensive Agriculture/Non-Prime/Grazing Lands
2. Resources and Rural Development
3. General Commercial
4. Heavy Industrial
5. Public Facilities

The uses allowed and standards required in the Renewable Energy Combining Zone shall be in addition to those of the primary zoning district.

C. Limitations and Designation Criteria

The Renewable Energy Combining Zone may be applied only to property meeting all of the following designation criteria, if applicable.

1. The Renewable Energy Combining Zone may not be combined with the Land Intensive Agricultural zone with prime soils.
2. The Renewable Energy Combining Zone shall not be placed on any property under a Land Conservation Act (Williamson Act) contract or within an open space or conservation easement.
3. The Renewable Energy Combining Zone may not be combined with any residential zone.
4. The Renewable Energy Combining Zone shall not be placed within the approach zone (outer or inner safety zones) or the inner turning zones for any public-use airport.
5. The Renewable Energy Combining Zone shall not be applied to areas within the General Plan, Area Plan or Specific Plan designated as Biotic, Historic or Scenic Resources, nor applied in conjunction with any combining zones to protect those designated resources, unless a protective easement is established to ensure protection of the resources.
6. The Renewable Energy Combining Zone shall not be applied within 300 feet of an urban service area or urban growth boundary for a city or unincorporated community, or any land zoned for urban residential use. The Renewable Energy Combining Zone may be applied to industrial and commercial zones within or outside of urban service areas.

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D. Permitted Uses

All uses allowed as permitted uses by the primary zone district with which the Renewable Energy Combining Zone is combined shall be permitted in the Renewable Energy Combining Zone, subject to the provisions and standards of the primary zone.

In addition to the uses allowed by the primary zoning district, the following renewable energy facilities shall be allowed, subject to an administrative permit and the site planning and development standards of Section XX-XX-XXX.

1. Solar Energy Facilities (SEF) up to 30 acres in site area, subject to the special use standards of Section F.
2. Transmission lines less than 100kV and related substations associated with a renewable energy facility

E. Uses Permitted with a Use Permit

In addition to the uses permitted with a use permit by the primary zoning district, the following renewable energy facilities may be permitted subject to granting of a use permit and compliance with the site planning and development standards of Section XX-XX-XXX, unless otherwise exempted by state or federal law.

1. Large SEFs, subject to the standards in Section F.
2. Transmission lines over 100kV, pipelines, substations and similar facilities associated with a renewable energy facility
3. Other hybrid or emerging renewable energy technologies, which in the opinion of the review authority are of a similar and compatible nature to those uses described in this section

F. Development Standards and Special Use Regulations

The following development standards and special use regulations shall apply to renewable energy facilities, if applicable.

1. Aesthetics

- a. **All Areas**—All ground-mounted facilities shall comply with the following standards, unless waived by the review authority.
 - i. If lighting is required, it shall be motion-sensored, fully shielded, and downward casting such that light does not spill onto adjacent parcels or the night sky. Floodlights are not permitted.
 - ii. The renewable energy facility shall be landscaped with drought-tolerant or other appropriate vegetation indigenous to the area to screen the fencing to

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the extent feasible from view from designated scenic public roads and along property lines that adjoin existing residential uses to soften the view.

- iii. The operator of the renewable energy facility shall maintain the facility including all required landscaping in compliance with the approved design plans, and shall keep the facility free from weeds, dust, trash and debris.
- b. **Scenic or Historic Resource Areas**—Proposed facilities located within a historic or scenic resource area as designated in the General Plan, Area Plan or zoning code shall require administrative review of materials, colors, landscape, fencing and lighting plans. In designated Scenic Resource Areas, the renewable energy facility shall be sited behind natural topography, existing vegetation or supplemental landscaping indigenous to the area to screen the facility from public view to the extent feasible, unless waived by the review authority. Equipment cabinets and structures shall be painted to blend with the surrounding property.

2. Air Quality

During site preparation, grading and construction, the renewable energy facility operator must implement best management practices to minimize dust and wind erosion, including regularly watering roads and construction staging areas as necessary, and minimizing vehicle idling and number of vehicle trips. Paved roads shall be swept as needed to remove any soil that has been carried onto them from the facility site.

3. Air Safety

Renewable energy facilities shall be sited and operated to avoid hazards to air navigation. Sites located within an airport traffic zone shall be required to provide an analysis documenting compliance with this standard. Renewable energy facilities shall not be located within the approach zone (outer or inner safety zones) or the inner turning zones for any public-use airport. If located on airport lands, the facility must meet the building setback approved on the Airport Layout Plan. The owner or operator of a facility approved within a public airport's traffic zone shall be required to record an aviation easement, and may be required to mark or light the facility for air traffic safety. The operator shall notify the Federal Aviation Administration of any structures in an airport traffic zone that are more than 200 feet above ground level or that exceed airport imaginary surfaces as defined in Federal Aviation Regulations Part 77. The renewable energy facility shall comply with any conditions imposed by federal agencies.

4. Biological Resources

Renewable energy facilities shall be sited to avoid or minimize impacts to: the habitat of special status species, including threatened, endangered or rare species; Environmentally Sensitive Habitat Areas; designated important habitat/wildlife linkages or areas of connectivity; and areas of Habitat Conservation Plans or Natural Community Conservation Plans that preclude development. Renewable energy facilities located within these areas or potentially impacting these areas shall require a use permit. A biological resource study prepared by a qualified biologist shall be required at the time of facility application to identify potential impacts and demonstrate that the facility avoids protected species to the maximum extent feasible. Identified mitigation measures shall be incorporated into California Environmental Quality Act (CEQA) documents and facility approvals. Any required compensatory mitigation shall be perpetual.

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Appendix B: Renewable Energy Combining Zone

5. *Cultural and Historic Resources*

Renewable energy facilities shall be sited to avoid or mitigate impacts to significant cultural and historic resources, as well as sacred landscapes. Facilities located within a Historic District shall be subject to design review by the historic review committee of the local jurisdiction, unless otherwise exempt. Facilities requiring a use permit that result in ground disturbance shall require a cultural resources records search and, if necessary, a cultural resources field survey at the time of facility application. Consultation with Native American tribes for sacred landscapes and sensitive cultural resources shall be conducted as part of the environmental review process.

Grading plans for all renewable energy facilities shall include notes that require the contractor to halt work within the vicinity of any archeological, historical or cultural resources or artifacts that may be discovered during construction or operation. If cultural resources are discovered during construction, the operator shall notify the local agency and a qualified professional shall be retained at the applicant's expense to evaluate the find and determine any measures to mitigate impacts including avoidance, removal, preservation or recordation in accordance with California law. The operator shall implement any feasible mitigation measures as determined by the local agency. If human remains are discovered, the County Coroner must also be notified and consultation with the Native American Heritage Commission may be required to determine the most likely descendants.

6. *Agricultural Resources*

Siting of renewable energy facilities shall avoid "Important Farmlands" to streamline permitting. Important Farmlands are agricultural land classified as Prime Farmland, Farmland of Statewide Importance, Unique Farmland or Locally Important Farmland, as designated in the state Farmland Mapping and Monitoring Program. If a renewable energy facility will impact Important Farmlands the facility shall include conditions for mitigation for the temporary or permanent loss of these Important Farmlands, unless determined by the Agriculture Commissioner that these Important Farmlands are marginally productive or contaminated. Mitigation for the temporary or permanent loss of Important Farmlands may be satisfied by an on-site agricultural management plan, dedication of perpetual agricultural conservation easements either on-site or off-site and held by a qualified conservation organization or other arrangements satisfactory to the County. Facilities may pay an in-lieu fee if allowed by County requirements. If significant impacts to Important Farmlands are not mitigated, then a use permit and an Environmental Impact Report (EIR) shall be required.

If the facility is located on a site under a Land Conservation Act (Williamson Act) contract, the facility must be listed as a compatible use in the Agricultural Preserve Rules and allowed by the type of contract. The total site area for all compatible uses including renewable energy facilities shall not be greater than 15 percent of the parcel or 5 acres, whichever is less, unless determined by the Board of Supervisors in consultation with the Agriculture Commissioner that a larger site area is consistent with the principles of compatibility in Government Code Section 51238.1.

7. *Erosion and Sediment Control*

The renewable energy facility must have a storm water permit from Public Works and an Erosion and Sediment Control Plan approved prior to beginning grading or construction.

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Appendix B: Renewable Energy Combining Zone

The plan must include best management practices for erosion control during and after construction, and permanent drainage and erosion control measures to prevent damage to local roads or adjacent areas, and to minimize sediment and storm water run-off into waterways, agricultural lands and habitat areas.

8. *Fire Protection*

The renewable energy facility shall be subject to Fire Safety Standards. The operator must implement a Fire Prevention Plan for construction and ongoing operations approved by the County Fire Marshall and local fire protection district. The plan shall include, but not be limited to: emergency vehicle access and turn-around at the facility site(s), addressing, vegetation management and fire break maintenance around structures.

9. *Grading, Access and Parking*

Renewable energy facilities shall be sited to maintain natural grades and use existing roads for access to the extent practical. Construction of new roads shall be avoided as much as possible. Natural grades shall be restored and re-vegetated for temporary access roads, construction staging areas, or field office sites used during construction. The operator shall maintain an all-weather access road for maintenance and emergency vehicles.

10. *Proximity to Transmission Lines and Utility Notification*

Upgrades to distribution or transmission facilities shall be identified and addressed as part of the CEQA review process. No building permit for a renewable energy facility shall be issued until evidence has been provided that the proposed interconnection is acceptable to the affected utility.

If new distribution, transmission, or substation facilities are required and the utility is an investor-owned utility, the California Public Utilities Commission (CPUC) may need to approve a Permit to Construct or a Certificate of Public Convenience and Necessity. Coordination with the CPUC is essential prior to renewable energy facility approval.

11. *Security and Fencing*

The site area for a renewable energy facility must be fenced or other appropriate measures to prevent unauthorized access and provide adequate signage. Wildlife friendly fencing shall be used in rural areas. If needed, security lighting shall be operated by motion sensors. Access gates and equipment cabinets must be locked at all times.

12. *Signs*

Temporary signs describing the facility, and providing contact information for the contractor and operator shall be placed during construction and must be removed prior to final inspection and operation. Signs for public or employee safety are required. No more than two signs relating the address and name of the operator/facility may be placed on-site, subject to design review. Outdoor displays, billboards or advertising signs of any kind either on- or off-site are prohibited.

13. Decommissioning and Restoration

A Decommissioning Plan shall be required and shall include the following:

- a. Removal of all aboveground and underground equipment, structures, fencing and foundations to a depth of three feet below grade. Underground equipment, structures and foundations located at least three feet below grade that do not constitute a hazard or interfere with the use of the land do not need to be removed.
- b. If applicable, removal of substations, overhead poles, above ground electricity transmission lines located on-site or within the public right of way if determined not to be usable to any other public or private utility.
- c. Removal of graveled areas and access roads.
- d. Regrading and placement of like-kind topsoil after removal of all structures and equipment.
- e. An Erosion Control Plan.
- f. Revegetation of disturbed areas with native seed mixes and plant species suitable to the area.
- g. The timeframe for completion of removal and decommissioning activities.
- h. An engineer's cost estimate for all aspects of the decommissioning plan, including use of prevailing wage rates, and credit for the salvage value of the panels and system materials.
- i. A statement signed by the owner or operator that they take full responsibility for reclaiming the site in accordance with the Decommissioning Plan and Use Permit approval upon cessation of use.

The renewable energy facility operator is required to notify the Planning Department immediately upon termination or cessation of use or abandonment of the operation. The operator shall remove components of the facility when it becomes functionally obsolete or is no longer in use. The operator shall begin decommissioning and removal of all equipment, structures, footings/foundations, signs, fencing, and access roads within 90 days from the date the facility ceases operation, and shall return the site to an appropriate end-use within the timeframe specified in the Decommissioning Plan.

14. Financial Assurance

At the time of issuance of the permit for the construction of the facility, the operator shall provide financial assurance in a form and amount acceptable to the local agency to secure the expense of decommissioning and removing all equipment, structures, fencing, and reclaiming the site and associated access or distribution lines in compliance with the approved reclamation plan.

15. Workforce Development

The operator shall be encouraged to participate in the a regional occupational training program, or a similar program approved by the county, providing job training in renewable energy, and restoration and land stewardship, by providing an annual

CCPDA SEF Permit Streamlining Guide**Appendix B: Renewable Energy Combining Zone**

contribution to fund the program and providing access to the facility by teachers and students, for the term of the lease or facility use.

Submittal of a Local Hiring Plan is required prior to applying for a building permit for new construction valued at above \$___ [to be established by each County]___. The Plan shall set voluntary targets for local hiring, along with a protocol for sequencing local job recruitment activities prior to advertising outside the County or region as determined by the County Planning Director or designee. The Plan shall also include annual monitoring and reporting requirements during construction.

Center for Climate Change Law at Columbia Law School

Model Small-Scale Solar Siting Ordinance

Last updated Summer 2012

Please send comments to Shelley Welton, swelto@law.columbia.edu

Model Small-Scale Solar Siting Ordinance

By Danielle Sugarman

Center for Climate Change Law at Columbia Law School

1. Purpose & Intent

A. Solar energy is a renewable and non-polluting energy resource that can prevent fossil fuel emissions and reduce a municipality's energy load. Energy generated from solar energy systems can be used to offset energy demand on the grid where excess solar power is generated.

B. The use of solar energy equipment for the purpose of providing electricity and energy for heating and/or cooling is a priority and is a necessary component of the [Town/City/Village's] current and long-term sustainability agenda.¹

C. The ordinance aims to promote the accommodation of solar energy systems and equipment and the provision for adequate sunlight and convenience of access necessary therefor.²

2. Definitions

ACCESSORY STRUCTURE

A structure, the use of which is customarily incidental and subordinate to that of the principal building and is attached thereto, and is located on the same lot or premises as the principal building.³

ALTERNATIVE ENERGY SYSTEMS

Structures, equipment, devices or construction techniques used for the production of heat, light, cooling, electricity or other forms of energy on site and may be attached to or separate from the principal structure.⁴

BUILDING-INTEGRATED PHOTOVOLTAIC (BIPV) SYSTEMS

A solar energy system that consists of integrating photovoltaic modules into the building structure, such as the roof or the façade and which does not alter the relief of the roof.⁵

¹ Albany City

² Amenia Town, Auburn City, Bedford Town, Bethlehem Town, Canandaigua Town, Glennville Town, Haverstraw Town, Hewlett Neck Village, Horseheads Town, Kent Town, Kingston City, Southold Town, Southport Town

³ Clinton Town, Kingston Town.

⁴ Albion Town, Barre Town, Lackawanna City, Medina Village

⁵ Albany City

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COLLECTIVE SOLAR

Solar installations owned collectively through subdivision homeowner associations, college student groups, “adopt-a-solar-panel” programs, or other similar arrangements.

EXPEDITED REVIEW

The grant of a priority status to an application that results in the review of the application ahead of applications filed prior thereto, including applications which may be currently under review by the applicable agency.⁶

FLUSH-MOUNTED SOLAR PANEL

Photovoltaic panels and tiles that are installed flush to the surface of a roof and which cannot be angled or raised.⁷

FREESTANDING OR GROUND-MOUNTED SOLAR ENERGY SYSTEM

A solar energy system that is directly installed in the ground and is not attached or affixed to an existing structure.⁸

NET-METERING

A billing arrangement that allows solar customers to get credit for excess electricity that they generate and deliver back to the grid so that they only pay for their net electricity usage at the end of the month.

PERMIT GRANTING AUTHORITY

The [Town/City/Village] authority charged with granting permits for the operation of solar energy systems.

PHOTOVOLTAIC (PV) SYSTEMS

A solar energy system that produces electricity by the use of semiconductor devices, called photovoltaic cells that generate electricity whenever light strikes them.⁹

QUALIFIED SOLAR INSTALLER

A person who has skills and knowledge related to the construction and operation of solar electrical equipment and installations and has received safety training on the hazards involved. Persons who are on the list of eligible photovoltaic installers maintained by the New York State Energy Research and Development Authority (NYSERDA), or who are certified as a solar installer by the North American Board of Certified Energy Practitioners (NABCEP), shall be deemed to be qualified solar installers for the purposes of this definition. Persons who are not on NYSERDA’s list of eligible installers or NABCEP’s list of certified installers

⁶ Huntington Town

⁷ *Derived from* Town of Brookhaven

⁸ Albany City

⁹ Albany City

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may be deemed to be qualified solar installers if the [Town/City/Village] determines such persons have had adequate training to determine the degree and extent of the hazard and the personal protective equipment and job planning necessary to perform the installation safely. Such training shall include the proper use of special precautionary techniques and personal protective equipment, as well as the skills and techniques necessary to distinguish exposed energized parts from other parts of electrical equipment and to determine the nominal voltage of exposed live parts.¹⁰

ROOFTOP OR BUILDING MOUNTED SOLAR SYSTEM

A solar power system in which solar panels are mounted on top of the structure of a roof either as a flush-mounted system or as modules fixed to frames which can be tilted toward the south at an optimal angle.¹¹

SMALL-SCALE SOLAR

For purposes of this Ordinance, the term “small-scale solar” refers to solar photovoltaic systems that produce up to ten kilowatts (kW) per hour of energy or solar-thermal systems which serve the building to which they are attached, and do not provide energy for any other buildings.

SOLAR ACCESS

Space open to the sun and clear of overhangs or shade including the orientation of streets and lots to the sun so as to permit the use of active and/or passive solar energy systems on individual properties.¹²

SOLAR COLLECTOR

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 the generation of electricity or transfer of stored heat.¹³

SOLAR EASEMENT

An easement recorded pursuant to NY Real Property Law § 335-b, the purpose of which is to secure the right to receive sunlight across real property of another for continued access to sunlight necessary to operate a solar collector.¹⁴

SOLAR ENERGY EQUIPMENT/SYSTEM

Solar collectors, controls, energy storage devices, heat pumps, heat exchangers, and other materials, hardware or equipment necessary to the process by which solar radiation is collected, converted into another form of energy, stored,

¹⁰ Ithaca Town

¹¹ *Derived from* Albany City

¹² Albion Town, Barre Town, Dickenson Town, Le Ray Town, Madena Village

¹³ Albany City, Ithaca Town

¹⁴ *Derived from* California Solar Shade Control Act Section 801.5 (Cal. Civ. Code §801), Iowa Code § 564A

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protected from unnecessary dissipation and distributed. Solar systems include solar thermal, photovoltaic and concentrated solar.¹⁵

SOLAR PANEL

A device for the direct conversion of solar energy into electricity.¹⁶

SOLAR POWER FAST-TRACK PROGRAM

A program to expedite all applications for commercial and residential solar panel installation to encourage the use of reliable and clean renewable energy.¹⁷

SOLAR STORAGE BATTERY

A device that stores energy from the sun and makes it available in an electrical form.¹⁸

SOLAR-THERMAL SYSTEMS

Solar thermal systems directly heat water or other liquid using sunlight. The heated liquid is used for such purposes as space heating and cooling, domestic hot water, and heating pool water.

3. Applicability

- A. The requirements of this Ordinance shall apply to all Small Scale solar energy systems (residential, commercial, multi-family and condominium) modified or installed after the effective date of this Ordinance.
- B. Solar energy systems for which a valid permit has been properly issued or for which installation has commenced prior to the effective date of this article shall not be required to meet the requirements of this Ordinance except in accordance with §§5(D), (E) and (F).
- C. All solar energy systems shall be designed, erected and installed in accordance with all applicable codes, regulations and standards.¹⁹
- D. Solar energy collectors shall be permitted only to provide power for use by owners, lessees, tenants, residents, or other occupants of the premises on which they are erected, but nothing contained in this provision shall be construed to prohibit “collective solar” installations or the sale of excess power through a “net billing” or “net-metering” arrangement in accordance

¹⁵ Albany City

¹⁶ Livonia Town

¹⁷ Huntington Town

¹⁸ Ithaca Town

¹⁹ Bronxville Village, Garden City Village

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with New York Public Service Law § 66-j or similar state or federal statute.²⁰

4. Permitting

- A. No Small Scale solar energy system or device shall be installed or operated in the [Town/City/Village] of [] except in compliance with this article.
- B. To the extent practicable, and in accordance with [Town/City/Village] law, the accommodation of solar energy systems and equipment and the protection of access to sunlight for such equipment shall be encouraged in the application of the various review and approval provisions of the [Town/City/Village] Code.²¹
- C. Rooftop and Building-Mounted Solar Collectors: Rooftop and building mounted solar collectors are permitted in all zoning districts in the [Town/City/Village] subject to the following conditions:²²
 1. Building permits shall be required for installation of all rooftop and building-mounted solar collectors,²³ except:
 - a. A building permit shall not be required for Flush-Mounted Photovoltaic Panels.²⁴
 2. Any height limitations of the [Town/City/Village] Code shall not be applicable to solar collectors provided that such structures are erected only to such height as is reasonably necessary to accomplish the purpose for which they are intended to serve, and that such structures do not obstruct solar access to neighboring properties.²⁵
 3. Optional add-on: [Placement of solar collectors on flat roofs shall be allowed as of right in non-historic districts, provided that panels do not extend horizontally past the roofline.]²⁶

²⁰ Briarcliff Manor Village

²¹ Milton Town

²² Ithaca Town

²³ Albany City, Briarcliff Manor Village, Town of Brookhaven, Ithaca Town, Town of Southampton, Tonawanda Town

²⁴ Town of Brookhaven, Town of Southampton

²⁵ Albion Town, Albion Village, Blooming Grove Town, Medina Village, Monroe Village, North Salem Town, Nyack Village, Perry Village, Port Jervis City, Shandaken Town, Spring Valley Village, Tivoli Village, Union Town, Wheatfield Town

²⁶ Albany City

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- D. Building-Integrated Photovoltaic (BIPV) Systems: BIPV systems are permitted outright in all zoning districts.
- E. Ground-Mounted and Free Standing Solar Collectors: Ground-mounted and free standing solar collectors are permitted as accessory structures in all zoning districts of the [Town/City/Village], subject to the following conditions:
 - 1. Building permits are required for the installation of all ground-mounted solar collectors.²⁷
 - 2. The location of the solar collector meets all applicable setback requirements for accessory structures in the zoning district in which it is located.²⁸
 - 3. Optional add-on: [The height of the solar collector and any mounts shall not exceed [20] feet when oriented at maximum tilt.²⁹]
 - 4. Optional add-on: [Solar energy equipment shall be located in a manner to reasonably minimize view blockage for surrounding properties and shading of property to the north, while still providing adequate solar access for collectors].³⁰
 - 5. Optional add-on: [Freestanding solar energy collectors shall be screened when possible and practicable through the use of architectural features, earth berms, landscaping, or other screening which will harmonize with the character of the property and surrounding area.]³¹
- F. Solar-Thermal Systems: Solar-thermal systems are permitted in all zoning districts subject to the following condition:
 - 1. Building permits are required for the installation of all solar-thermal systems.
- G. Solar energy systems and equipment shall be permitted only if they are determined by the [Town/City/Village] not to present any unreasonable safety risks, including, but not limited to, the following:

²⁷ Briarcliff Manor Village, Erie Town, Ithaca Town,

²⁸ Albany City, Briarcliff Manor Village, Ithaca Town

²⁹ Ithaca Town

³⁰ Albany City

³¹ Briarcliff Manor Village

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1. Weight load³²
2. Wind resistance³³
3. Ingress or egress in the event of fire or other emergency.³⁴

H. Optional add-on: [Installations in designated historic districts as shall require a certificate of appropriateness from the [Town/City/Village's] [Historic Commission] unless such installations are not visible from the street.]³⁵

5. Safety

- A. All solar collector installations must be performed by a qualified solar installer.³⁶
- B. Prior to operation, electrical connections must be inspected by a [Town/City/Village] [Code Enforcement Officer] and by an appropriate electrical inspection person or agency, as determined by the [Town/City/Village].³⁷
- C. Any connection to the public utility grid must be inspected by the appropriate public utility.³⁸
- D. Solar energy systems shall be maintained in good working order.
- E. Rooftop and building-mounted solar collectors shall meet New York's Uniform Fire Prevention and Building Code standards.³⁹
- F. If solar storage batteries are included as part of the solar collector system, they must be placed in a secure container or enclosure meeting the requirements of the New York State Building Code when in use and when no longer used shall be disposed of in accordance with the laws and regulations of [Town/City/Village] and other applicable laws and regulations.⁴⁰

³² Great Neck Plaza Village

³³ Great Neck Plaza Village

³⁴ Great Neck Plaza Village

³⁵ *Derived from Albany City*

³⁶ Ithaca Town

³⁷ Ithaca Town

³⁸ Ithaca Town

³⁹ Copake Town

⁴⁰ Ithaca Town

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- G. Optional add-on: [If a solar collector ceases to perform its originally intended function for more than 12 consecutive months, the property owner shall remove the collector, mount and associated equipment by no later than 90 days after the end of the twelve-month period.]⁴¹

6. Appeals

- A. If an individual is found to be in violation of the provisions of this Ordinance, appeals should be made in accordance with the established procedures of the [Town/City/Village] code.⁴²
- B. If a building permit for a solar energy device is denied because of a conflict with other goals of the [Town/City/Village], the applicant may seek relief from the [Town/City/Village] [Board of Zoning Appeals], which shall regard solar energy as a factor to be considered, weighed and balanced along with other factors.⁴³

7. Optional add-on: [Solar Panel Fast Track Program]

- A. This section applies to the installation of solar panels for commercial buildings and residences.
- B. All building permit application fees for the construction and installation of solar panels on residential and non-residential buildings shall be waived.⁴⁴
- C. All building permit applications for the installation of solar panels on residential and non-residential buildings shall receive expedited review by the [Town/City/Village] [Department of Engineering Services] in order to expedite such applications and the issuance of building permits for solar panel installation.]⁴⁵

8. Optional add-on: [Zoning for Future Solar Access]

- A. New structures will be sited to take advantage of solar access insofar as practical, including the orientation of proposed buildings with respect to sun angles, the shading and windscreen potential of existing and proposed

⁴¹ Albany City, Ithaca Town

⁴² Albany City

⁴³ *Derived from* Albany City

⁴⁴ Huntington Town

⁴⁵ Huntington Town

vegetation on and off the site, and the impact of solar access to adjacent uses and properties.⁴⁶

- B. To permit maximum solar access to proposed lots and future buildings, wherever reasonably feasible, consistent with other appropriate design considerations, new streets shall be located on an east-west axis to encourage building siting with the maximum exposure of roof and wall area to the sun.⁴⁷ The [Town/City/Village] [Zoning Board] shall also consider the slope of the property and the nature and location of existing vegetation as they affect solar access.⁴⁸
- C. The impact of street trees on the solar access of the surrounding property shall be minimized to the greatest possible extent in selecting and locating shade trees. Every effort shall be made to avoid shading possible locations of solar collectors.⁴⁹
- D. When the [Planning Board/Zoning Board] reviews and acts upon applications for subdivision approval or site plan approval, it shall take into consideration whether the proposed construction would block access to sunlight between the hours of [9:00 a.m. and 3:00 p.m.] Eastern Standard Time for existing approved solar energy collectors or for solar energy collectors for which a permit has been issued.
- E. The [City/Town/Village] [Planning Board] may require subdivisions to be platted so as to preserve or enhance solar access for either passive or active systems, consistent with the other requirements of the [City/Town/Village] Code.⁵⁰
- F. The plan for development of any site within cluster subdivisions shall be designed and arranged in such a way as to promote solar access for all dwelling units.⁵¹ Considerations may include the following:
 - 1. In order to maximize solar access, the higher-density dwelling units should be placed on a south-facing slope and lower-density dwelling units sited on a north-facing slope.⁵²

⁴⁶ Bedford Town, Bethlehem Town, Briarcliff Manor Village, Clinton Town, Kent Town, LaGrange Town, Millbrook Village

⁴⁷ Elmsford Village, Hasting-On-Hudson Village, Hewlett Bay Park Village, Millbrook Village, Town of New Castle

⁴⁸ Elmsford Village, Hasting-on-Hudson Village, Hewlett Bay Park Village

⁴⁹ Milbrook Village

⁵⁰ Ithaca Town

⁵¹ East Fishkill Town, Monroe Town, Monroe Village

⁵² Town of Southport

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2. Subject to the [City/Town/Village's] setback requirements, structures should be sited as close to the north lot line as possible to increase yard space to the south for reduced shading of the south face of a structure.⁵³
3. A tall structure should be sited to the north of a short structure.]⁵⁴

Comment on §8

Cities/Towns/Villages should be aware that New York's Real Property Law §335-b allows for the creation of solar easements between residents who wish to negotiate for airspace rights. New York's solar easement provision is a voluntary contract which may be entered into in order to ensure uninterrupted solar access for solar energy devices. Under NY Real P. § 335-b solar easement agreements are required to contain at a minimum, information describing the easement location and the vertical and horizontal angles over which the easement extends, provisions governing the granting and termination of the easement, and provisions for compensation to either party in the event that interference occurs.

Cities/Towns/Villages that wish to promote the creation of solar easements should consider adopting language supporting the same. Solar easements are beneficial in that property entitlements are clearly defined and neighbors can negotiate for compensation in the event of interference with the terms of the easement without requiring the city/town/village to be seen as prioritizing one particular use over another.

Comment on §8(D)

While it would be optimal if installed solar collectors were not subsequently blocked by a neighbors construction, landowner's possess no common law right to unobstructed sunlight.⁵⁵ Thus, laws that prevent property owners from making use of their property in ways which would block sunlight to neighboring solar collectors may be seen as seizing private airspace rights.⁵⁶ Thus, one possible resolution would be if landowners would purchase airspace easements or covenants from their neighbors.⁵⁷

Comment on §8(F):

⁵³ New Windsor Town, Southport Town

⁵⁴ New Windsor Town, Southport Town

⁵⁵ For a more detailed summary of the evolution of laws regarding rights to light, see Troy Rule, *Shadows on the Cathedral: Solar Access Laws in a Different Light*, U. Ill. L. Rev., Vol. 2010, p. 851, 865-66 (April 26, 2010) available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1466224.

⁵⁶ Troy Rule, *Airspace in a Green Economy*, University of Missouri School of Law Legal Studies Research Paper No. 2011-05, 39-44 (April 04, 2011) available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1782071. [UCLA Law Review, Vol. 59, Issue 2, forthcoming 2011.](#)

⁵⁷ *Id.*

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Any restrictions on construction designed to facilitate solar access should recognize that there are often numerous energy-saving and anti-sprawl benefits associated with greater urban densities (which often require greater building heights and/or more creative designing) and that solar access is only one of several considerations in planning new developments.

9. Tree Maintenance and Removal

- A. Optional add-on: [To the extent that the [City/Town/Village] has discretion regarding the removal or relocation of trees, solar access shall be a factor taken into consideration when the [City/Town/Village] determines whether trees can be removed.]⁵⁸

Comment on §9(B):

In reaching decisions on tree maintenance and removal, the [Town/City/Village] may wish to weigh solar access against other factors such as; the environmental impact of the proposed tree removal, the potential impact on erosion and drainage, the potential alternatives to the proposed action, and whether the [City/Town/Village] or private landowner will replant replacement trees of a similar or different species, or add other vegetative material, fencing or terracing, or undertake other similar measures to offset the negative effects of tree removal.

⁵⁸ *Derived from Briarcliff Manor Village, Clarence Town, Hamburg Town, New Rochelle City. See also City of Gainesville, Florida. Fl §30-254*

Model Zoning for the Regulation of Solar Energy Systems¹
Department of Energy Resources
Massachusetts Executive Office of Energy and Environmental Affairs
March 2014

This model zoning and accompanying Guidance were prepared to assist Massachusetts cities and towns in establishing reasonable standards to facilitate development of solar energy systems. These systems include small-, medium- and large-scale as well as both ground-mounted and roof-mounted installations.² The model zoning language provided here is not intended for adoption precisely as it is written. Communities will need to carefully consider how this language may be modified to suit local conditions and where it should be inserted into an existing Zoning Bylaw/Ordinance. Further, it is highly recommended that any language adapted from this model be reviewed by municipal counsel prior to adoption.

As small-, medium-, and large-scale ground-mounted and roof-mounted solar energy systems become more prevalent in Massachusetts, many communities are attempting to regulate the installation of these systems through their Zoning Bylaw/Ordinance. Developing these regulations has been particularly challenging for a number of reasons. Most notably, the Massachusetts General Laws contains several provisions that specifically address the ability of local governments to regulate solar energy systems and/or to protect solar access from development or vegetation (shading) on adjacent properties. While the language within Chapter 40A Section 3 states that a local government may not prohibit these uses, it does say they cannot be “unreasonably regulated” without providing guidance on what that particular phrase means. The Solar Energy Systems Policy Guidance, which accompanies this model zoning and succeeding sections of this document provide more explanation regarding the implications of the statutes on this issue and its significance to local zoning.

Unlike model bylaws/ordinances typically developed by the Commonwealth, the regulatory language provided here is not packaged as a “stand-alone” section of a Zoning Bylaw/Ordinance. With ground-mounted and roof-mounted solar energy systems, the statutory framework and “accessory” nature of some of these installations lend themselves to a different approach. This model zoning therefore assumes that municipalities will have many “typical” sections within their Zoning Bylaw/Ordinance and that several of these sections would be amended to address this issue. For the purposes of this model zoning, the Bylaw/Ordinance sections that are amended include:

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² This material was prepared by the Horsley Witten Group.

*The Definitions Section;
Allowable Uses;
Dimensional Requirements; and
Site Plan Review.*

There is also further discussion intended to help communities regulate these systems in the context of a Local Historic District.

Definitions

Commentary: Within a Zoning Bylaw/Ordinance, the Definitions Section usually stands alone. Definitions are also sometimes included as a sub-section within other sections of the Zoning Bylaw/Ordinance. For example, terms related to the protection of water resources may be included in a water resource protection overlay district section. We recommend that the following terms be added to the general Definitions Section of the Zoning Bylaw/Ordinance.

Photovoltaic System (also referred to as Photovoltaic Installation): An active solar energy system that converts solar energy directly into electricity.

Rated Nameplate Capacity: The maximum rated output of electric power production of the photovoltaic system in watts of Direct Current (DC).

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

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

Commentary: While it is anticipated that installed solar energy systems will most frequently be photovoltaic, this model zoning uses the statutory definition of a solar energy system, which is broader and permits the installation of solar thermal systems as well.

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 generation, or water heating.

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

Solar Energy System, Grid-Intertie: A photovoltaic system that is connected to an electric circuit served by an electric utility.

Solar Energy System, Ground-Mounted: An Active Solar Energy System that is structurally mounted to the ground and is not roof-mounted; may be of any size (small-, medium- or large-scale).

Solar Energy System, Large-Scale: An Active Solar Energy System that occupies more than 40,000 square feet of surface area (equivalent to a rated nameplate capacity of about 250kW DC or greater).

Solar Energy System, Medium-Scale: An Active Solar Energy System that occupies more than 1,750 but less than 40,000 square feet of surface area (equivalent to a rated nameplate capacity of about 10 - 250 kW DC).

Solar Energy System, Off-Grid: A photovoltaic solar energy system in which the circuits energized by the solar energy system are not electrically connected in any way to electric circuits that are served by an electric utility.

Solar Energy System, Passive: 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.

Solar Energy System, Roof-Mounted: An Active Solar Energy System that is structurally mounted to the roof of a building or structure; may be of any size (small-, medium- or large-scale).

Solar Energy System, Small-Scale: An Active Solar Energy System that occupies 1,750 square feet of surface area or less (equivalent to a rated nameplate capacity of about 10 kW DC or less).

Solar Thermal System: An Active Solar Energy System that uses collectors to convert the sun's rays into useful forms of energy for water heating, space heating, or space cooling.

Use Regulations

Commentary: Within a Zoning Bylaw/Ordinance, the Use Regulations describe which land uses are allowed within different zoning districts of the community, and which permits are required. The Use Regulations typically include a Use Table and/or a narrative description of the principal and accessory uses that are allowed, prohibited and/or allowed only through a Special Permit within each zoning district.

Pursuant to Chapter 40A Section 3, a Massachusetts municipality may not prohibit or unreasonably regulate solar energy systems except where necessary to protect public health, safety or welfare. Therefore, although these systems must be allowed within the community, they may be regulated where necessary to protect public health, safety or welfare through other provisions of the Zoning Bylaw/Ordinance. For example, these systems will still need to meet dimensional regulations and other performance standards necessary to protect public health, safety or welfare. In addition, a Site Plan Review process may be used to collect information that will ensure compliance with the performance standards in the Zoning Bylaw/Ordinance. Where some communities include Design Review in their permit processes, these communities will need to balance their desire for certain design objectives with the Commonwealth's protection of solar energy systems. Finally, as drafted this model zoning requires a special permit for a large-scale ground-mounted facility in a residential district and prohibits such systems in another residential district. While a special permit is discretionary, and language expressing uncertainty and cautioning communities about the lack of case law regarding Chapter 40A Section 3 has been included, the Attorney General's Office has approved local

zoning using this permitting mechanism. While DOER cannot offer a definitive interpretation, limited use of special permits when applied to the largest of solar systems, especially when these systems are allowed elsewhere by right, may well be reasonable regulation. In DOER's view, given the plain language of the statute, it is prudent to allow opportunity to site all scales of solar energy systems somewhere in the community. These provisions are described in more detail in the following sections. A more detailed discussion of DOER's understanding of Chapter 40A Section 3 is provided in the Policy Guidance for Regulating Solar Energy Systems that serves as a companion piece to this regulatory guidance.

As a cautionary note, while regulating aesthetics can arguably be considered a matter of protecting public welfare, attempting to place restrictions on materials, setbacks or height, and other similar items, as related to aesthetics, can create roadblocks to actual installation. It is therefore not recommended that communities regulate aesthetics of solar energy systems, or that they do so very cautiously, due to the strong statutory protections in Chapter 40A Section 3.

Two examples are provided in this section for how roof-mounted, small-scale ground-mounted, medium-scale ground-mounted, and large-scale ground-mounted solar energy systems can be incorporated into a municipality's Use Regulations. In these examples, roof-mounted solar energy systems, regardless of size, are allowed as-of-right throughout the community. As-of-right siting means that development may proceed without the need for a Special Permit, variance, amendment, waiver, or other discretionary approval. These projects cannot be prohibited, and can be built once a building permit has been issued by the inspector of buildings, building commissioner or local inspector.

For ground-mounted systems, there is a distinction between how small-scale, medium-scale and large-scale systems are treated and where each are allowed as-of-right, via site plan review, or by special permit. The model zoning allows small-scale ground-mounted systems as-of-right throughout the community. These are of a size that would service a house, small businesses, or small municipal building.

The model zoning allows medium-scale ground-mounted systems as-of-right in all districts except residential zoning districts; in these districts Site Plan Review is required. This means that medium-scale ground-mounted systems cannot be prohibited, and that DOER considers Site Plan Review reasonable regulation. Site Plan Review is discussed in more detail later in this document, but in general it establishes criteria for the layout, scale, appearance, safety, and environmental impacts of certain types and/or scales of development. Typically, site plan approval must be obtained before the building permit is issued. Since medium-scale ground-mounted systems can reach up to approximately an acre in size, DOER believes it is reasonable and appropriate to provide more regulatory scrutiny via Site Plan Review for these projects in residential districts to protect public health, safety, or welfare.

As drafted, the model zoning requires Site Plan Review for large-scale ground-mounted systems within most zoning districts, a special permit in one residential district, and prohibits such systems in another residential district. However, communities should remember that the language of the zoning exemption for solar energy systems is imprecise. While some communities already require a Special Permit to install a large-scale ground mounted solar facility, and/or

restrict them to certain districts, it is not clear whether these regulations are consistent with the Chapter 40A Section 3 mandate that they be reasonable and necessary to protect public health, safety, or welfare.

Connection to the Massachusetts Green Communities Designation and Grant Program

Recognizing the uncertainty around how regulations may or may not be interpreted as reasonable, DOER allows communities to meet Green Communities Criterion One by zoning for the as-of-right installation of a solar facility of at least an acre in size in a designated location. For more information on the Green Communities Designation and Grant Program, please visit: <http://www.mass.gov/eea/energy-utilities-clean-tech/green-communities/>.

Siting Preferences

Where a solar facility is sited, as well as placement on the site once selected, is an important consideration, particularly in regard to large-scale ground mounted facilities. DOER strongly discourages locations that result in significant loss of land and natural resources, including farm and forest land, and encourages rooftop siting, as well as locations in industrial and commercial districts, or on vacant, disturbed land. Significant tree cutting is problematic because of the important water management, cooling, and climate benefits trees provide.

In regard to farm properties, rooftops are preferable. If roof space is inadequate non-productive, non-arable agricultural land is the second choice. Should this also prove infeasible or inadequate a dual use of land design concept could preserve productive farmland by continuing crop production underneath high-mounted and well spaced panels. Finally, if none of these are feasible or they are inadequate the least productive land should be used first to minimize the loss of productive food/crop land.

Overlay Zoning Districts

Overlay zoning districts are one zoning approach that could be used to permit solar energy systems, and in ways not allowed under the base zoning districts. For example, the model zoning as drafted requires Site Plan Review for medium-scale ground mounted solar energy systems in residential districts. An overlay district could be used to permit such facilities without Site Plan Review in a portion of these residential districts where Site Plan Review is deemed unnecessary, while retaining the review for the balance of the districts.

In addition, some communities may wish to conduct a feasibility analysis to determine where large-scale solar energy systems are most appropriate within the municipality and use an overlay zoning district approach to encourage the siting of facilities in the most feasible locations. Once an area has been established through a thoughtful and analytical process, the municipality could enact overlay zoning legislation to prioritize these areas for large-scale solar energy systems. Many Massachusetts communities have already taken this approach through adoption of a large-scale ground-mounted solar overlay district, often based on DOER's [Model As-of-Right Zoning Bylaw: Allowing Use of Large-Scale Ground-Mounted Solar Photovoltaic Installations](#).

Agricultural Exemption:

In addition to the exemption pertaining to solar energy systems Section 3 of Chapter 40A also exempts agricultural uses from zoning regulations that would otherwise apply. Thus, when the majority of the power from a solar energy system (or a wind turbine) is integral to farm production construction and operation of the system would covered by the exemption. Questions on the applicability of the agricultural exemption to solar energy systems should be directed to Gerry Palano at the Dept. of Agricultural Resources (Gerald.Palano@state.ma.us or 617-626-1706).

Example 1 (Use Tables):

	Residential-1 (R1)	Residential-2 (R2)	Residential-3 (R3)	Commercial (C)	Industrial (I)	Public (P)
<u>PRINCIPAL USE</u>						
Medium-Scale Ground-Mounted Solar Energy System	SPR	SPR	SPR	Y	Y	Y
Large-Scale Ground-Mounted Solar Energy System	SP	N	SPR	SPR	SPR	SPR

Y = Allowed

SP = Special Permit

N = Prohibited

SPR = Site Plan Review

	Residential-1 (R1)	Residential-2 (R2)	Residential-3 (R3)	Commercial (C)	Industrial (I)	Public (P)
<u>ACCESSORY USE</u>						
Roof-Mounted Solar Energy System	Y	Y	Y	Y	Y	Y
Small-Scale Ground-Mounted Solar Energy System	Y	Y	Y	Y	Y	Y
Medium-Scale Ground-Mounted Solar Energy System	SPR	SPR	SPR	Y	Y	Y

Y = Allowed

SP = Special Permit

N = Prohibited

SPR = Site Plan Review

Example 2 (Uses listed):

1.0 Residential District Uses

1.1 Uses Permitted

1.1.1 Roof-Mounted Solar Energy Systems

1.1.2 Small-Scale Ground-Mounted Solar Energy Systems

1.2 Uses Allowed through Site Plan Review

- 1.2.1 Medium-Scale Ground-Mounted Solar Energy Systems
- 1.2.2 Large-Scale Ground-Mounted Solar Energy Systems in the R3 District

1.3 Uses Allowed via Special Permit

- 1.3.1 Large-Scale Ground-Mounted Solar Energy Systems in the R1 District

2.0 Non-Residential District Uses

2.1 Uses Permitted

- 2.1.1 Roof-Mounted Solar Energy Systems
- 2.1.2 Small-Scale Ground-Mounted Solar Energy Systems
- 2.1.3 Medium-Scale Ground-Mounted Solar Energy Systems

2.2 Uses Allowed through Site Plan Review

- 2.2.1 Large-Scale Ground-Mounted Solar Energy Systems

Dimensional Regulations

Commentary: In most cases, the existing dimensional standards in a Zoning Bylaw/Ordinance will allow for the development of small-, medium-, and large-scale solar energy systems. However, if a municipality finds alternate dimensional standards are necessary to allow solar energy systems while protecting public health, safety, or welfare, it may impose them. As a reminder, while regulating aesthetics can arguably be considered a matter of protecting public welfare, attempting to place restrictions on dimensional standards, such as setbacks or height, as they relate to aesthetics can create roadblocks to actual installation. It is therefore not recommended that communities regulate aesthetics of solar energy systems due to the strong statutory protections in Chapter 40A Section 3, or that they do so very carefully.

With regard to more basic dimensional requirements such as setbacks from the property line, municipalities may also find that adjustments can be made to encourage broader use of solar energy systems. Below is a series of dimensional regulation amendments that a municipality could adopt to further encourage small-, medium-, and large-scale ground-mounted and roof-mounted solar energy systems, or simply clarify requirements pertaining to them.

Height

Commentary: It is recommended that for purposes of height, roof-mounted solar energy systems should be considered similar to chimneys, television antennae, roof-top mechanical equipment and other appurtenances that are usually either allowed a much higher maximum height (e.g., 100 feet instead of 35 feet) or are exempted altogether from building height requirements. Such

an exemption can be stated in the definition of “Building Height” or through language similar to that provided in the following example.

It is recommended that existing zoning district height limitations apply for all ground-mounted solar energy systems. If the ground-mounted solar energy system is accessory to a principal building or structure on a lot, then the height restriction for accessory structures would apply. If the ground-mounted solar energy system is the principal structure on a lot, then the height restriction for principal structures would apply.

Example:

1.0 Building Height Regulations

1.1 Exemptions

1.1.1 Mechanical equipment and appurtenances necessary to the operation or maintenance of the building or structure itself, including chimneys, ventilators, plumbing vent stacks, cooling towers, water tanks, broadcasting and television antennae and roof-mounted solar energy systems.

Setbacks

Commentary: It is recommended that small- and medium-scale ground-mounted solar energy systems that are accessory to a primary building or structure on a lot be provided with more flexible setback requirements than those that would typically apply to a primary structure. Many communities already provide some flexibility for “accessory structures” like sheds, allowing these to be closer to the lot line than the primary structure. For example, where a front/side/rear yard setback for the primary structure may be 50 feet, setbacks of 20 feet may be allowed for accessory structures. When ground-mounted solar energy systems are developed as accessory structures to a home, business or other building or structure, they should be afforded at least the same flexibility.

If a community does not have this type of reduced setback already built into the Zoning Bylaw/ Ordinance, a provision could be added that effectively reduces the setback distance just for this use. For example, if the community has a dimensional table, a special footnote could be added to the dimensional table as indicated in the following examples. It should be noted that often times there is a distinction between how accessory structures are regulated in a residential zoning district and how they are regulated in a commercial or industrial district. Therefore, communities should ensure that provisions for flexible setbacks for small- and medium-scale ground-mounted solar energy systems are incorporated wherever appropriate.

The first example applies a reduction of 50% to the otherwise required setbacks for accessory uses. The value of 20 feet is used in the second example; however, this may be altered based on local conditions. For example, in some communities, particularly urban communities, the required side- and rear-yard setback distances may be shorter than 20 feet. In these

circumstances, the existing shorter setback distances should remain for small- and medium-scale ground-mounted solar energy systems.

As opposed to small- and medium-scale ground-mounted solar energy systems, which are typically sited as accessory to a principal building or structure on a lot, large-scale ground-mounted solar energy systems are usually sited as principal structures. Whenever a solar energy system is sited as a principal structure on a lot, it is recommended that the setback requirements for principal structures in that zoning district apply. Regardless of the scale of the system or the minimum setback required solar energy system installers often allow a sufficient setback to avoid the issue of shading by vegetation on neighboring properties.

Placement of solar energy systems in front yards should be avoided if at all possible. However, in DOER's view the statutory protections for solar energy systems create a situation where a ground-mounted array could not be prohibited outright in a front yard, so the language provided in the following example includes a standard for the front yard setback. DOER recognizes the concerns this may raise in residential neighborhoods and acknowledges that communities should work with property owners to find appropriate locations for ground-mounted systems in side or rear yards.

Example Dimensional Table Footnotes for Accessory Installations:

- (1) Small- and medium-scale ground-mounted solar energy systems accessory to principal use may be located no closer than [1/2 of the setback that would otherwise apply] from the front, side or rear lot line. All ground-mounted solar energy systems in residential districts shall be installed either in the side yard or rear yard to the extent practicable
- (2) Small- and medium-scale ground-mounted solar energy systems accessory to a principal use may be located no closer than [twenty (20) feet] from the front, side or rear lot line. All ground-mounted solar energy systems in residential districts shall be installed either in the side yard or rear yard to the extent practicable.

Lot Coverage

Commentary: A number of communities use "maximum lot coverage" or "maximum impervious surface" as one of their dimensional standards. While it is clear that such features as driveways or buildings would be included in any calculation of lot coverage, many other features may be more ambiguous depending on how clearly the definition in the Zoning Bylaw/Ordinance is written. Awnings, porches, decks and similar features can often become a matter of dispute. Regardless of the definition, it is recommended that solar energy systems with grass or another pervious surface under them be exempted from lot coverage or impervious surface calculations. If the area is to be paved or otherwise rendered impervious then this land area should in fact count toward any coverage or impervious surface limit. It is also important to note that this recommended exemption is not intended to apply to municipal stormwater regulations, as the panels could have the effect of altering the volume, velocity, and discharge pattern of stormwater runoff. The following provision could be included as a footnote to the Dimensional Table related

to maximum lot coverage and impervious cover requirements, or as a separate provision within the dimensional regulations.

Example:

Solar energy systems shall not be included in calculations for lot coverage or impervious cover as defined in [INSERT SECTION REFERENCE FOR ‘DEFINITIONS’].

Site Plan Review Requirements and Performance Standards

Commentary: Although not specifically addressed under Chapter 40A, Site Plan Review is included within the local Zoning Bylaws/Ordinances of many Massachusetts communities. Site Plan Review is meant to enforce clear and fair design standards for different types of development. This is typically done through a coordinated review process that circulates development applications among, and invites input from, all local boards and commissions that might permit a project, including Local Historic District Commissions as applicable. Site Plan Review is usually triggered by either specific types of uses (e.g., commercial or industrial development), or certain scales of uses (e.g., non-residential buildings over 5,000 square feet).

Typically, Site Plan Review procedures and requirements are provided within a separate section of the Zoning Bylaw/Ordinance. However, there are instances when communities provide separate Site Plan Review provisions and procedures within a section pertaining to a particular use or development type (e.g., Planned Business Development, etc.). Consistent with the Legislature’s intent to facilitate the siting of solar energy, communities should shape the Site Plan Review provisions of their Zoning Bylaws/Ordinances to enable large-, medium- and small-scale solar energy system projects to proceed without undue delay.

Model language for Site Plan Review for medium-scale ground-mounted solar energy systems is provided in the following Example 1. As discussed earlier in this document, Site Plan Review may be appropriate when medium-scale ground-mounted systems are sited within residential districts. The model language provided in Example 1 below is based on, but is less stringent than, the provisions in the Massachusetts DOER [Model As-of-Right Zoning Bylaw: Allowing Use of Large-Scale Ground-Mounted Solar Photovoltaic Installations](#).

Example 2 provides model language for Site Plan Review for large-scale ground-mounted solar energy systems when they are permitted as of right. As discussed earlier in this document, Site Plan Review may be appropriate for large-scale ground-mounted systems when they are sited anywhere within the community. The model language provided in Example 2 below is based on the provisions in the Massachusetts DOER [Model As-of-Right Zoning Bylaw: Allowing Use of Large-Scale Ground-Mounted Solar Photovoltaic Installations](#). Example 2 is also intended for use in concert with the special permit language in the next section of this model zoning.

Example 3 provides model language for roof-mounted and small-scale ground-mounted systems when they are part of a larger project where Site Plan Review is triggered through another threshold (e.g., commercial development, non-residential buildings over 5,000 square feet, etc.). It is important to note that the installation of roof-mounted or small-scale ground-mounted solar

energy systems does not trigger Site Plan Review on its own. However, when such systems are included as part of a larger development proposal that requires Site Plan Review, the municipality has the opportunity to review the roof-mounted or small-scale ground-mounted solar energy systems as part of the larger proposal.

As discussed earlier in this document, while regulating aesthetics can arguably be considered a matter of protecting public welfare, attempting to place restrictions on solar energy systems as they relate to aesthetics can create roadblocks to actual installation. It is therefore not recommended that communities regulate aesthetics of solar energy systems, or that they do so very cautiously, due to the strong statutory protections in Chapter 40A Section 3. However, where communities already have Site Plan Review standards that relate to aesthetics, such as screening requirements, these standards should also apply to solar energy systems. In other words, solar energy systems should not be singled out and regulated more stringently than other uses that require Site Plan Review; however, they can be held to the same level of restrictions that are in place for other uses.

Example 1 (Site Plan Review provisions for medium-scale ground-mounted solar energy systems in residential zoning districts):

1.0 Site Plan Review

1.1 Applicability

- 1.1.1 Medium-scale ground-mounted solar energy systems proposed within residential zoning districts shall undergo Site Plan Review prior to construction, installation or modification as provided in this section.

1.2 Site Plan Document Requirements

Pursuant to the Site Plan Review process, the project proponent shall provide the following documents, as deemed applicable by the Site Plan Review Authority:

1.2.1 A site plan showing:

- (a) Property lines and physical features, including roads, for the project site;
- (b) Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures;
- (c) Blueprints or drawings of the solar energy system showing the proposed layout of the system, any potential shading from nearby structures, the distance between the proposed solar collector and all property lines and existing on-site buildings and structures, and the tallest finished height of the solar collector;

- (d) Documentation of the major system components to be used, including the panels, mounting system, and inverter;
- (e) Name, address, and contact information for proposed system installer;
- (f) Name, address, phone number and signature of the project proponent, as well as all co-proponents or property owners, if any;
- (g) The name, contact information and signature of any agents representing the project proponent; and
- (h) Zoning district designation for the parcel(s) of land comprising the project site.

If the following are not addressed in existing site plan review regulations, then the community may wish to include them:

- (i) Locations of active farmland and prime farmland soils, wetlands, permanently protected open space, Priority Habitat Areas and BioMap 2 Critical Natural Landscape Core Habitat mapped by the Natural Heritage & Endangered Species Program (NHESP) and “Important Wildlife Habitat” mapped by the DEP.*
- (j) Locations of floodplains or inundation areas for moderate or high hazard dams;*
- (k) Locations of local or National Historic Districts;*

1.2.2 Proof that the project proponent will meet the required Site Plan Review notification procedures.

Commentary: Provision 1.2.2 above should reference the municipality’s existing Site Plan Review public and/or abutter notification procedures if applicable. For example, a community may require projects that are subject to Site Plan Review to notify all property owners within 100 feet of the project site.

1.3 Site Plan Review Design Standards

1.3.1 Standards for medium-scale ground-mounted solar energy systems proposed within residential zoning districts

- 1.3.1.1 Utility Notification - No grid-intertie photovoltaic system shall be installed until evidence has been given to the Site Plan Review Authority 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.

1.3.1.2 Utility Connections - Reasonable efforts, as determined by the Site Plan Review Authority, shall be made to place all utility connections from the solar photovoltaic installation underground, depending on appropriate soil conditions, shape, and topography of the site and any requirements of the utility provider. Electrical transformers for utility interconnections may be above ground if required by the utility provider.

1.3.1.3 Safety - The medium-scale ground-mounted solar energy system owner or operator shall provide a copy of the Site Plan Review application to the local fire chief. All means of shutting down the solar installation shall be clearly marked.

Commentary: With regard to issues of access and safety, communities looking to adopt zoning for medium-scale solar energy systems should be aware of any unique local requirements that could apply. For example, if the fire department will want an Emergency Response Plan as part of approval, this should be folded into the review process as seamlessly as possible.

1.3.1.4 Visual Impact – Reasonable efforts, as determined by the Site Plan Review Authority, shall be made to minimize visual impacts by preserving natural vegetation, screening abutting properties, or other appropriate measures.

1.3.1.5 Land Clearing, Soil Erosion and Habitat Impacts - Clearing of natural vegetation shall be limited to what is necessary for the construction, operation and maintenance of ground-mounted solar energy systems or as otherwise prescribed by applicable laws, regulations, and bylaws/ordinances.

Commentary: As drafted, this model zoning does not require medium-scale ground mounted solar energy systems to be fenced, but this is something communities will want to consider. Regardless, many project proponents will find fencing prudent.

Example 2 (Site Plan Review provisions for large-scale ground-mounted solar energy systems):

1.0 Site Plan Review

1.1 Applicability

1.1.1 Large-scale ground-mounted solar energy systems shall undergo Site Plan Review prior to construction, installation or modification as provided in this section.

1.2 Site Plan Document Requirements

Pursuant to the Site Plan Review process, the project proponent shall provide the following documents, as deemed applicable by the Site Plan Review Authority:

1.2.1 A site plan showing:

- (a) Property lines and physical features, including roads, for the project site;
- (b) Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures;
- (c) Blueprints or drawings of the solar energy system signed by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts showing the proposed layout of the system, any potential shading from nearby structures, the distance between the proposed solar collector and all property lines and existing on-site buildings and structures, and the tallest finished height of the solar collector;
- (d) One or three line electrical diagram detailing the solar photovoltaic installation, associated components, and electrical interconnection methods, with all Massachusetts Electric Code (527 CMR 12.00) compliant disconnects and overcurrent devices;
- (e) Documentation of the major system components to be used, including the panels, mounting system, and inverter;
- (f) Name, address, and contact information for proposed system installer;
- (g) Name, address, phone number and signature of the project proponent, as well as all co-proponents or property owners, if any;
- (h) The name, contact information and signature of any agents representing the project proponent; and
- (i) Zoning district designation for the parcel(s) of land comprising the project site.

If the following are not addressed in existing site plan review regulations, then the community may wish to include them:

- (j) *Locations of active farmland and prime farmland soils, wetlands, permanently protected open space, Priority Habitat Areas and BioMap 2 Critical Natural Landscape Core Habitat mapped by the Natural Heritage & Endangered Species Program (NHESP) and "Important Wildlife Habitat" mapped by the DEP.*
- (k) *Locations of floodplains or inundation areas for moderate or high hazard dams;*
- (l) *Locations of local or National Historic Districts;*

- 1.2.2 Documentation of actual or prospective access and control of the project site (see also Section 1.3.1.1);
- 1.2.3 An operation and maintenance plan (see also Section 1.3.1.2);
- 1.2.4 Proof of liability insurance;
- 1.2.5 Description of financial surety that satisfies Section 1.3.3.3; and
- 1.2.6 A public outreach plan, including a project development timeline, which indicates how the project proponent will meet the required Site Plan Review notification procedures and otherwise inform abutters and the community.

Commentary: Provision 1.2.6 above should reference the municipality's existing Site Plan Review public and/or abutter notification procedures if applicable. For example, a community may require projects that are subject to Site Plan Review to notify all property owners within 100 feet of the project site.

1.3 Site Plan Review Design and Operation Standards

1.3.1 Standards for large-scale ground-mounted solar energy systems

- 1.3.1.1 Site Control - The project proponent shall submit documentation of actual or prospective access and control of the project site sufficient to allow for construction and operation of the proposed solar energy system.
- 1.3.1.2 Operation & Maintenance Plan - The project proponent shall submit a plan for the operation and maintenance of the large-scale ground-mounted solar energy system, which shall include measures for maintaining safe access to the installation, stormwater controls, as well as general procedures for operational maintenance of the installation.
- 1.3.1.3 Utility Notification - No grid-intertie photovoltaic system shall be installed until evidence has been given to the Site Plan Review Authority 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.
- 1.3.1.4 Lighting - Lighting of large-scale ground-mounted solar energy systems shall be consistent with local, state and federal law. Lighting of other parts of the installation, such as appurtenant structures, shall be limited to that required for safety and operational purposes, and shall be reasonably shielded from abutting properties. Where feasible, lighting of the solar energy

system shall be directed downward and shall incorporate full cut-off fixtures to reduce light pollution.

1.3.1.5 Signage - Signs on large-scale ground-mounted solar energy systems shall comply with a municipality's sign bylaw/ordinance. A sign consistent with a municipality's sign bylaw/ordinance shall be required to identify the owner and provide a 24-hour emergency contact phone number. Solar energy systems shall not be used for displaying any advertising except for reasonable identification of the manufacturer or operator of the solar energy system.

1.3.1.6 Utility Connections - Reasonable efforts, as determined by the Site Plan Review Authority, shall be made to place all utility connections from the solar photovoltaic installation underground, depending on appropriate soil conditions, shape, and topography of the site and any requirements of the utility provider. Electrical transformers for utility interconnections may be above ground if required by the utility provider.

1.3.1.7 Emergency Services – The large-scale ground-mounted solar energy system owner or operator shall provide a copy of the project summary, electrical schematic, and site plan to the local fire chief. Upon request the owner or operator shall cooperate with local emergency services in developing an emergency response plan. All means of shutting down the solar energy system shall be clearly marked. The owner or operator shall identify a responsible person for public inquiries throughout the life of the installation.

Commentary: With regard to issues of access and safety, communities looking to adopt zoning for large-scale solar energy facilities should be aware of any unique local requirements that could apply.

1.3.1.8 Land Clearing, Soil Erosion and Habitat Impacts - Clearing of natural vegetation shall be limited to what is necessary for the construction, operation and maintenance of solar energy system or otherwise prescribed by applicable laws, regulations, and bylaws/ordinances.

1.3.2 Monitoring and Maintenance

1.3.2.1 Solar Energy System Installation Conditions - The large-scale ground-mounted solar energy system owner or operator shall maintain the facility in good condition. Maintenance shall include, but not be limited to, painting, structural repairs, and integrity of security measures. Site access shall be maintained to a level acceptable to the local Fire Chief, Emergency Management

Director, and Emergency Medical Services. The owner or operator shall be responsible for the cost of maintaining the solar energy system and any access road(s), unless accepted as a public way.

1.3.2.2 Modifications - All material modifications to a large-scale ground-mounted solar energy system made after issuance of the required building permit shall require approval by the Site Plan Review Authority.

1.3.3 Abandonment or Decommissioning

1.3.3.1 Removal Requirements

Any large-scale ground-mounted solar energy system which has reached the end of its useful life or has been abandoned consistent with Section 1.3.3.2 of this bylaw/ordinance shall be removed. The owner or operator shall physically remove the installation no more than 150 days after the date of discontinued operations. The owner or operator shall notify the Site Plan Review Authority by certified mail of the proposed date of discontinued operations and plans for removal. Decommissioning shall consist of:

- (a) Physical removal of all solar energy systems, structures, equipment, security barriers and transmission lines from the site.
- (b) Disposal of all solid and hazardous waste in accordance with local, state, and federal waste disposal regulations.
- (c) Stabilization or re-vegetation of the site as necessary to minimize erosion. The Site Plan Review Authority may allow the owner or operator to leave landscaping or designated below-grade foundations in order to minimize erosion and disruption to vegetation.

1.3.3.2 Abandonment

Absent notice of a proposed date of decommissioning or written notice of extenuating circumstances, the large-scale ground-mounted solar energy system shall be considered abandoned when it fails to operate for more than one year without the written consent of the Site Plan Review Authority. If the owner or operator of the solar energy system fails to remove the installation in accordance with the requirements of this section within 150 days of abandonment or the proposed date of decommissioning, the town retains the right, after the receipt of an appropriate court order, to enter and remove an abandoned, hazardous, or decommissioned large-scale ground-mounted solar energy system.

As a condition of Site Plan approval, the applicant and landowner shall agree to allow entry to remove an abandoned or decommissioned installation.

1.3.3.3 Financial Surety

Proponents of large-scale ground-mounted solar energy system projects shall provide a form of surety to cover the cost of removal in the event the town must remove the installation and remediate the landscape, in an amount determined to be reasonable by the Site Plan Review Authority and the project proponent. The project proponent may choose to provide the surety in the form of a bond or escrow account. In no event shall the amount exceed more than 125 percent of the cost of removal and compliance with the additional requirements set forth herein, as determined by the project proponent and Site Plan Review Authority. Such surety will not be required for municipally- or state-owned facilities. The project proponent shall submit a fully inclusive estimate of the costs associated with removal, prepared by a qualified engineer. The amount shall include a mechanism for calculating increased removal costs due to inflation.

Commentary: As drafted, this model zoning does not require large-scale ground mounted solar energy systems to be fenced, but this is something communities will want to consider. Regardless, many project proponents will find fencing prudent.

Example 3 (Site Plan Review provisions for roof-mounted and small-scale ground-mounted solar energy systems as part of a larger project that triggers Site Plan Review):

1.0 Site Plan Review

1.1 Site Plan Document Requirements

1.1.1 Requirements for Roof-Mounted and Small-Scale Ground-Mounted Solar Energy Systems - Where these solar energy systems may be accessory to a use allowed through Site Plan Review, the Site Plan Review shall include review of their adequacy, location, arrangement, size, design, and general site compatibility.

1.1.1.1 Roof-Mounted Solar Energy Systems – For all roof-mounted systems, the applicant shall provide:

- (a) The shortest distance between the solar collector and all edges of the roof.
- (b) The distance between the solar collector and any other existing rooftop features such as chimneys, spires, access points, etc.

- (c) The height of the solar collector both from finished grade and, where applicable, from the finished surface of the roof.

1.1.1.2 Small-Scale Ground-Mounted Solar Energy Systems – For all ground-mounted systems, the applicant shall provide:

- (a) The distance between the proposed solar collector and all property lines and existing on-site buildings and structures.
- (b) The tallest finished height of the solar collector.
- (c) Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures.

1.1.1.3 System Components – The Plan must include documentation of the major system components to be used, for example the panels, mounting system, and inverter.

1.1.1.4 Installer Details – The Plan must include the name, address, and contact information for proposed system installer.

1.2 Site Plan Review Design Standards

1.2.1 Standards for roof-mounted and small-scale ground-mounted solar energy systems

1.2.1.1 Utility Notification - No grid-intertie photovoltaic system shall be installed until evidence has been given to the Site Plan Review Authority 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.

1.2.1.2 Emergency Access - Solar energy systems shall be located in such a manner as to ensure emergency access to the roof, provide pathways to specific areas of the roof, provide for smoke ventilation opportunities, and provide emergency egress from the roof.

- (a) For buildings with pitched roofs, solar collectors shall be located in a manner that provides a minimum of one three-foot wide clear access pathway from the eave to the ridge on each roof slope where solar energy systems are located as well as one three-foot smoke ventilation buffer along the ridge.
- (b) Residential rooftops that are flat shall have a minimum three-foot wide clear perimeter and commercial buildings that are flat shall have a minimum four-foot wide clear perimeter between a solar energy system and the roofline, as well as a

three-foot wide clear perimeter around roof-mounted equipment such as HVAC units.

- (c) To the extent practicable, the access pathway shall be located at a structurally strong location on the building (such as a bearing wall).

Commentary: Building and Fire Department personnel should be involved in the development of emergency access standards, and any zoning standards that are adopted should be consistent with local building and fire codes.

- 1.2.1.3 Safety – No roof-mounted solar energy system shall be located in a manner that would cause the shedding of ice or snow from the roof into a porch, stairwell or pedestrian travel area.

Special Permits

Commentary: Special Permits are addressed in Chapter 9 of the Zoning Act, and most Massachusetts communities have regulations pertaining to them within their zoning bylaw or ordinance. Below is model language for municipalities requiring special permits for large-scale ground-mounted solar energy systems. It is intended to be adopted and implemented alongside Site Plan Review language for large-scale ground-mounted systems included as Example 2 in this model zoning. Rather than include separate special permit standards applicable specifically to large-scale ground-mounted solar energy systems, this language simply directs that a permit be issued pursuant to the already established special permit bylaw/ordinance of the community.

Municipalities will, however, want to audit their special permit language, especially the approval standards, for compatibility with the siting of large-scale ground-mounted solar energy systems. Such systems should have far lower impacts than commercial or industrial uses that often require issuance of special permit, and communities should keep in mind the requirement in Chapter 40A Section 3 that any regulations pertaining to solar energy systems be reasonable.

1.0 Special Permit with Site Plan Review

1.1 Special Permit Requirements

- 1.1.1 Where required a special permit shall be issued prior to construction, installation or modification of any large-scale ground-mounted solar energy system. The special permit granting authority shall include as part of its special permit review and proceedings all the provisions and requirements of the Site Plan Review standards applicable to large-scale ground-mounted solar energy systems.

Pre-Existing Non-Conforming Uses and Structures

Commentary: Alterations, extensions and structural changes to pre-existing non-conforming uses and structures (e.g., existing buildings that do not meet the dimensional requirements of the Zoning Bylaw/Ordinance) that intensify non-conformities or result in additional non-

conformities may not be allowed beyond a certain threshold or may require a Special Permit pursuant to the local Zoning Bylaw/Ordinance. It is recommended that the installation of roof-mounted or small-scale ground-mounted solar energy systems associated with pre-existing non-conforming uses or structures be exempt from this requirement. An example provision is provided below. Communities not comfortable with providing this exemption to small-scale ground mounted systems due to their potential to be located on very small lots may wish to apply Site Plan Review or continue to require a Special Permit where this can be justified to protect public health, safety, or welfare. As to roof mounted systems on non-conforming properties, given the exemption afforded solar energy systems, DOER believes it would be unreasonable to disallow them or require a Special Permit even when installation would exacerbate a pre-existing building height non-conformity.

Example:

1.0 Pre-Existing Non-Conforming Uses and Structures

1.1 Improvements that do not change the use or the basic exterior characteristics or appearance of the building or structure are allowed. Such improvements include but are not limited to the following:

1.1.1 Installation or replacement of solar energy systems.

Historic Districts

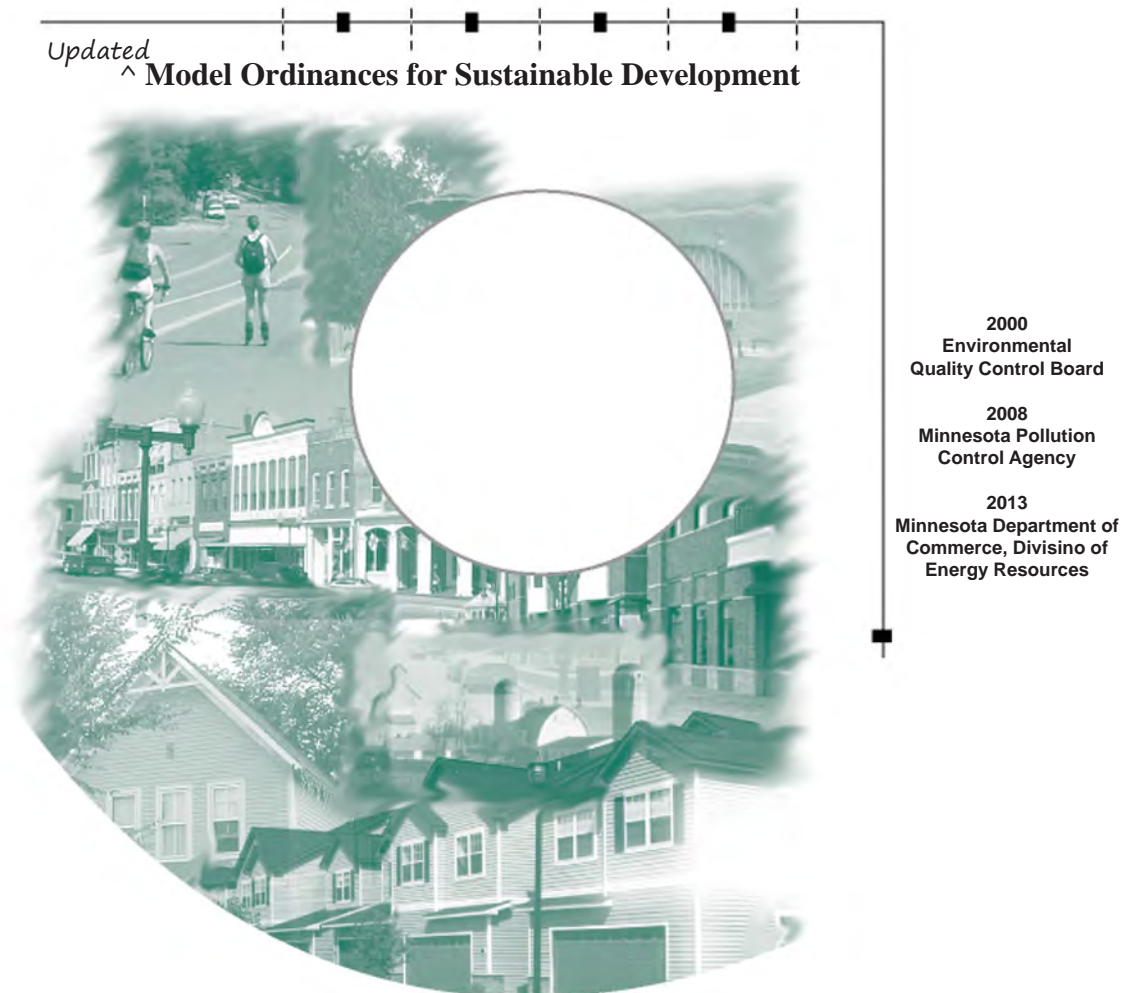
Commentary: Many communities in the Commonwealth have adopted Local Historic Districts to protect and preserve buildings, landscapes and neighborhoods of historic significance. In recent years, conflict has occasionally arisen about the installation of solar energy systems within these districts on historic buildings and structures, since some argue that they have adverse impacts on the visual appearance and integrity of the buildings and structures.

As described in the DOER Policy Guidance for Regulating Solar Energy Systems, Local Historic District Commissions must consider the policy of the Commonwealth to encourage the use of solar energy systems and to protect solar access when considering issuance of a certificate of appropriateness for a solar energy system. However, thoughtful design guidelines can help ensure that solar energy systems are sited while the goals of historic preservation continue to be achieved.

Design guidelines can require that solar energy systems not be visible from public areas, to the greatest extent practicable. When it is not feasible (either physically or economically) to locate solar energy systems out of the public eye, solar energy systems can be required to be designed to certain architectural standards (e.g., building-integrated, use of solar shingles) to the greatest extent practicable. However, these options may be infeasible as well due to the high cost and low performance of many of these technologies. To meet these challenges, Local Historic District Commissions are encouraged to write design guidelines that support the development of solar energy systems and are sensitive to the historic preservation goals of the Commission.

Solar Energy Standards - Urban Communities

From Policy to Reality



Updates funded by a 2008 Minnesota Pollution Control Agency Sustainable Communities Grant
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INTRODUCTION

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; the U.S. Department of Energy forecasts that solar energy will start to reach widespread cost parity with retail electric costs by 2016.

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) *Nuisance and safety considerations.* Solar energy 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 energy systems are ugly and unsafe, rooted in poorly designed 1970s solar installations, have sometimes resulted in unnecessary regulation or outright prohibitions.
- 2) *Protecting access to solar resources.* Development regulations can limit a property owner's ability to access their solar resource. Moreover, solar access can be limited by buildings or vegetation on adjacent lots, and should be a consideration in zoning districts that allow tall buildings or in developing communities where subdivisions should enhance or protect homeowner's access direct sunlight.
- 3) *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.

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. It has been updated several times to reflect different needs of Minnesota communities and the evolving solar industry, last updated February, 2014

Statutory Solar Access Requirement

Local governments within the seven-county metropolitan region are required under state law to address solar access in their comprehensive plans, and thus indirectly in their development regulation that implements the comprehensive plan (Minn. Stat. 473.859, Subd. 2[b]). Refer to the Metropolitan Council Land Planning Handbook for more information.

Components of a solar standards ordinance

Solar energy standards should consider the following elements:

- Remove regulatory barriers and create a clear regulatory path (an as-of-right installation) to solar development for both accessory and (if appropriate) principal uses such as solar farms and ground-mount community shared solar installations.
- Address solar access issues within the subject property to ensure reasonable access not unduly limited by height, setback, or coverage limitation, recognizing the distinct design and function of solar technologies.
- Define aesthetic standards that retain an as-of-right installation while balancing design concerns in urban neighborhoods, historic districts, and new subdivisions.
- Address solar access issues across property lines 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 energy systems are of less consequence outside urban density areas, where lot sizes are almost always greater than one acre. 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 portion of the model ordinance can also be applied in rural areas. Some provisions of this model are applicable to low-density or rural areas, but more appropriate language is provided in the model County ordinance provided in a separate document.

Principal and accessory uses

This ordinance addresses solar energy as an accessory use to the primary residential or commercial use in an urban area. Solar energy systems are also sometimes the primary use as on “solar farms” that are large arrays of hundreds or thousands of ground or pole-mounted panels, or in the case of solar thermal power plants, 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. Sample language addressing these principal solar land uses is provided in the county model solar ordinance.

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.
- 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 under used 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.

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.

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.

Solar Energy Standards

III. Definitions

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

Building-integrated Solar Energy Systems - An active solar energy 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 energy systems that are contained within roofing materials, windows, skylights, and awnings.

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

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

Passive Solar Energy 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 - Unobstructed access to the solar resource (see definition below) on a lot or building, including access across adjacent parcel air rights, for the purpose of capturing direct sunlight to operate a solar energy system.

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 Energy Standards

Solar Resource - A view of the sun from a specific point on a lot or building that is not obscured by any vegetation, building, or object for a minimum of four hours between the hours of 9:00 AM and 3:00 PM Standard time on any day of the year.

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 energy 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 energy 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 uses a vertically mounted collector 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 Resource

Understanding what defines a “solar resource” is foundational to understanding how land use regulation affects solar development. Solar energy resources are not simply where sunlight falls. A solar resource has minimum spatial and temporal characteristics, and needs to be considered not only today but also into the future. Solar energy equipment can not function as designed if installed in partial shade, with too few hours of daily or annual direct sunlight, or without southern or near-southern exposure. Many provisions of the model ordinance are predicated on the concept that a solar resource has definable characteristics that are affected by local land use decisions and regulation.

Solar Energy Standards

Height - Rooftop System

This ordinance notes exceptions to the height standard when other exceptions are granted in the ordinance. Communities should directly reference the exception language, rather than use the placeholder language here.

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 lower than the principal structure. Communities may want to consider balancing height with setback, allowing taller systems if set back farther, for instance, an extra foot of height for every additional two feet of setback.

Building Integrated PV

Building integrated solar energy systems can include solar energy 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.

Roof-Mounted Solar Energy Systems

This ordinance sets a threshold for solar panels that they not be steeper than the finished roof pitch. Mounted systems steeper than the finished roof pitch change the appearance of the roof, and sometimes create additional considerations in regard to the wind and drift load on structural roof components. Safety risks can be mitigated through structural review or roof structure modification if the aesthetic impacts are not a concern to the community.

Solar Mounting Devices - Racking, frames, or other 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.

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 energy systems must meet the following height requirements:

1. Building- or roof- mounted solar energy systems shall not exceed the maximum allowed height in any zoning district. For purposes for height measurement, solar energy systems other than building-integrated systems shall be given an equivalent exception to height standards as building-mounted mechanical devices or equipment.
2. Ground- or pole-mounted solar energy systems shall not exceed 20 feet in height when oriented at maximum tilt.

B. **Set-back** - 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.

1. **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, unless the collector and mounting system has been explicitly engineered to safely extend beyond the edge, and setback standards are not violated. 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 energy 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 energy 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 energy systems shall be allowed regardless of whether the system is visible from the public right-of-way, provided the building component in which the system is integrated meets all required setback,

Solar Energy Standards

land use or performance standards for the district in which the building is located.

2. **Solar Energy Systems with Mounting Devices** - Solar energy systems using roof mounting devices or ground-mount solar energy 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 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 energy systems, excluding building-integrated systems, shall allow for adequate roof access to the south-facing or flat roof upon which the panels are mounted. The surface area of pole or ground mount systems shall not exceed half the building footprint of the principal structure.

4. **Historic Buildings** - Solar energy 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.

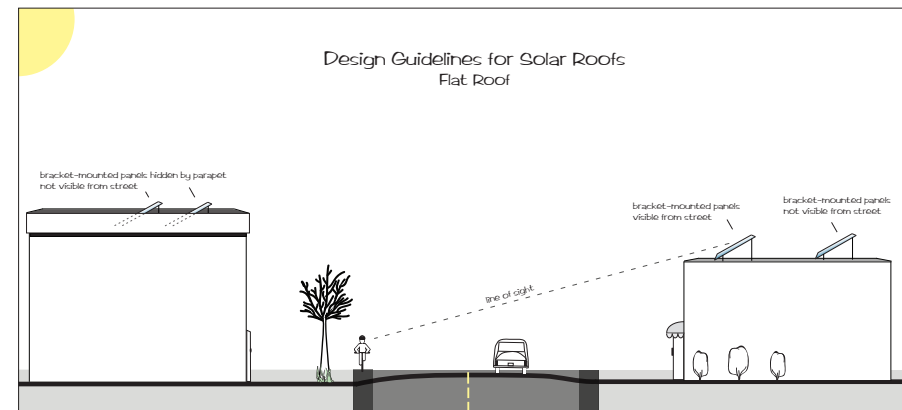
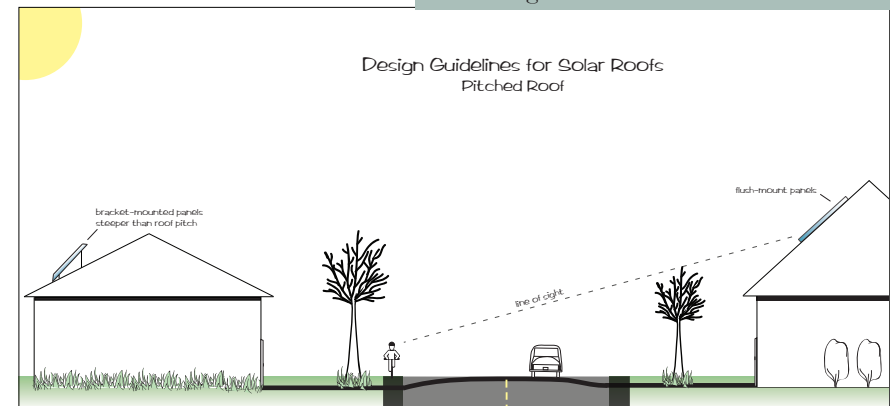
- D. **Approved Solar Components** - Electric solar energy system components must have a UL listing and solar hot water systems must have an SRCC rating.

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

1. **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.
 - a. **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

Coverage

Roof coverage limitations are generally not necessary, as some of the roof is likely to be shaded or otherwise not suitable for solar energy. Coverage is an issue of concern in order to ensure ready roof access in the event of a fire. Coverage limits can be a percentage limitation, such as 80% of the total south-facing roof, or a required setback from one or more edges.



Solar Energy Standards

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 burdensome additional regulation.

Restrictions on Solar Energy 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.

solar collector and the slope of the finished roof surface on which it is mounted.

- b. **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.

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 energy 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** - All grid-intertie solar energy systems shall comply with the interconnection requirements of the electric utility. Off-grid systems are exempt from this requirement.

- V. **Administrative Variance (or conditional use)** - 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 energy system, an administrative variance (or CUP) may be sought from the zoning official. An administrative variance (or CUP) shall be granted if the standards 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 within 45 degrees of south (180 degrees azimuth).

Solar Energy Standards

2. **Solar Electric (photovoltaic) Systems** - Solar collectors must have a pitch of between 20 and 65 degrees.
3. **Solar Hot Water Systems** - Solar collectors need to be mounted at a pitch between 40 and 60 degrees.
4. **System Location** - The system is located where the lot or building has a solar resource.

B. **Standards for an Administrative Variance (CUP)** - A variance shall be granted by the zoning official if the applicant meets the following safety, performance and aesthetic conditions:

1. **Aesthetic Conditions** - The solar energy 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 energy systems must be set back from the property line by one foot.

VI. Restrictions on Solar Energy 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 energy 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. **Solar Easements Allowed** - 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. **Easements within Subdivision Process** - 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.

Solar Energy Standards

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 PUDs 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 - Model Community has identified the following incentives for development applications or subdivisions that will include buildings using active solar energy 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. **Solar-Ready Buildings** - Model Community encourages builders to use solar-ready design in buildings. Buildings that submit a completed U.S. EPA's Renewable Energy Ready Home Solar Photovoltaic Checklist and associated documentation will be certified as a Model Community solar ready

home, a designation that will be included in the permit home's permit history.

- 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 energy 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
 2. An active solar thermal system must have at least 64 square feet of solar collector, and must have sufficient summer load to utilize collector output.



Template Solar Energy Development Ordinance for North Carolina

Executive Summary

North Carolina is rapidly becoming a leader in solar energy development not only in the southeast, but also in the US. Before the template, there was statewide discussion about how to regulate and permit solar energy systems, and no clear guide to creating one that does not overly burden industry or irresponsibly manage land use. Most local governments in NC, both at the municipal and county levels, provide some regulation on land use within their jurisdiction, yet most have yet to institute regulation for solar development. This template ordinance provides consensus input on a best practice model for how solar development can be regulated.

Template Solar Ordinance Meets a Growing Need

The rapid growth in solar development in NC makes this a very opportune time for development of the template ordinance, particularly because there is significant experience across the state with solar projects of all sizes, yet the industry is still at the early stages of its ongoing growth.

Template Approach Affords Flexibility

It is important to understand that the solar ordinance is a template rather than an enforceable rule or one-size-fits-all law. It is designed to be adapted and then adopted by jurisdictions across the state and to serve as the basis for local development ordinances in their respective communities. In this way the template solar ordinance provides valuable guidance while still allowing flexibility that local governments may want to help them best address local interests.

Broad Stakeholder Working Group Enhances Template's Value

The North Carolina Solar Center (NCSC) and the North Carolina Sustainable Energy Association (NCSEA) managed the development of the template ordinance and the organization of the drafting working group. The working group consisted of representatives of the solar industry, local NC planners, State Farm Bureau, NC Department of Agriculture, NC Department of Environment and Natural Resources (DENR), NC Association of County Commissioners, NC League of Municipalities, military, University of North Carolina School of Government, NC Conservation Network, Duke Energy Progress, North Carolina State University Forestry, Federal Aviation Administration (FAA), and many others. The initial draft was developed by NCSC and NCSEA in May 2013 based on a study of current NC solar ordinances and available state model ordinances. Throughout the summer and fall the working group, often in the form of smaller topic-specific focus groups, worked to improve and update the existing drafts. Additionally NCSC and NCSEA hosted five public forums across the state on the development of the template ordinance. At these forums NCSC and NCSEA convened a group of experts to inform interested stakeholders in the area about solar development and its regulation. The final three forums walked through the draft template and received valuable public feedback to assist with its development.

Template Ordinance Overview and Important Features

The ordinance covers photovoltaic as well as solar hot water projects, and classifies projects into one of three levels.

- Level 1 System:
 - Roof-mounted, building integrated, mounted over a parking lot, or ground-mounted and no more than half the footprint of the primary structure on the lot
 - A permitted use provided it meets applicable height, setback, aviation notification, and related district standards
- Level 2 System:
 - Ground-mounted system with a footprint of no more than ½ an acre in residential districts, no more than 10 acres in commercial/business districts or of any size in industrial districts
 - Subject to additional solar development standards (administrative approval)
- Level 3 System:
 - Systems that do not meet the requirements of Level 1 or 2 systems. Most solar farms are Level 3 systems.
 - Subject to the same solar development standards as Level 2
 - Require a public permit hearing (conditional/special use permit)

The template ordinance addresses some of the most common considerations that arise in the permitting of solar energy facilities. Some of the important topics covered in the ordinance include:

- Parcel Line Setbacks
- Height Limitations
- Aviation Notification (requires airport or FAA notification if project is within 5 nautical miles of an airport)
- Visibility (requirements regarding visual buffering, public signage, and lighting)
- Decommissioning (requires a decommissioning plan for the project)

There are other topics and resources that may be important to communities and other solar facility stakeholders but which were not deemed appropriate to include in the body of the template ordinance itself. Examples of those topics include wildlife habitat mapping and land lease considerations. These and other topics are nevertheless included in the form of appendices to the template ordinance document.

Implementation and Support

The template is designed to be used by jurisdictions across the state as a starting point for developing or updating their specific solar energy development regulations. However, there are natural limitations on the amount of information that can be included in the ordinance, even within multiple appendices. In order to facilitate local governments' access to the template ordinance and its contributors, the ordinance includes contact information for 30 individuals involved in the development of the template and who possess knowledge concerning various aspects of the ordinance. These organizations and individuals have agreed to share their contact information and serve as resources for fielding questions about the ordinance.

The Template Solar Energy Development Ordinance for North Carolina is available here:

[DSIRE website](#)

[NCSC website](#)

[NCSEA website](#)

Historical Document and information related to the template ordinance are available here:

[NCSC website](#)

[NCSEA website](#)

Introduction

Over the last few years, the state of North Carolina has experienced a massive increase in solar energy development. This can be attributed to many factors, including dramatic reduction in price of solar modules, state investment tax credit, state renewable energy portfolio standard (REPS), and long-term standard offer contracts offered by utilities for projects below five megawatts (MW) in capacity. According to SNL Financial's latest industry data, the state has an installed capacity of 245 MW as of June 3, 2013.¹ This positions North Carolina as fifth nationally in cumulative installed capacity.² Thus, the North Carolina Sustainable Energy Association (NCSEA) and the North Carolina Solar Center organized this collaborative effort to construct a template ordinance. This ordinance facilitates the adoption of local regulation backed by industry, government, and citizen input.

Constructing solar energy projects requires numerous considerations and entails a thorough process of siting, permitting, and construction. These projects represent valuable assets in the community – creating local construction jobs, workforce training, economic development, increased property tax base, and ongoing educational opportunities. The permitting process generates discussion in communities with respect to the size and location of projects. Larger systems are often sited on farmland, forestland, or other open spaces, which can impact multiple residents. Responsible development of solar resources in North Carolina requires careful and consistent regulation in order to preserve important existing resources while facilitating the growth of this valuable new industry.

North Carolina's land use planning and regulation is handled by local governments. Cities, towns, and counties may delineate zoning districts within their jurisdiction and regulate various types of development within those local zoning districts. As of 2012, 87% of the state's 550 cities and 79% of the state's 100 counties have adopted zoning ordinances.³ Of these, only 24 cities and 18 counties have incorporated solar development ordinances into their codes; each on a case-by-case basis. This inconsistent approach to solar development regulation has created a patchwork of disparate and often undefined approaches, potentially creating unnecessary barriers to investment and development.

This discontinuity of policy has prompted NCSEA and NC Solar Center to lead in the drafting of a template solar ordinance that will not only provide guidance on effective language for responsible regulation of solar development, but also educate the public about this technology and its application. The wider public input process included five forums located throughout the state and a six-week period of open comments on nine key development issue areas using the Institute for Emerging Issues "IEI Commons" online tool. The drafting process included four months of working group meetings and several rounds of revisions. The drafting Working Group consisted of key stakeholders from planning, local government, agriculture, forestry, economic development, environment, wildlife, utilities, solar industry, and other specialties. Consensus on each aspect of this template ordinance was the goal throughout the drafting process.

The template ordinance set forth in this document attempts to organize and harmonize the language for regulating solar at the county and city level while incorporating some best practices. It divides solar energy systems into three different levels. Level 1 addresses all rooftop, parking lot, small ground mount associated with a building, and building-integrated solar systems. Level 2 applies to all mid-sized ground mounted systems and requires the systems meet development standards set by the ordinance before approval. The applicant must submit the required documents to the Zoning Administrator who reviews them and may then

¹ <http://www.snl.com/InteractiveX/Article.aspx?cid=A-17930699-11303>

² Solar Energy Industries Association and GTM Research. (2011 & 2012). U.S. Solar Market Insight Report 2011 & 2012 in Review

³ David Owens and Dayne Battem, "2012 Zoning Survey Report: Zoning Adoption, Administration, and Provisions for Design Standards and Alternative Energy Facilities," *Planning and Zoning Law Bulletin: UNC School of Government* no. 20 (July 2012), 1

approve the application as meeting the development standards. Level 3 systems are generally larger scale ground-mounted solar systems, often referred to as solar farms. Level 3 systems must obtain a special/conditional use permit and conform to the development standards in this solar development ordinance. The ordinance suggests development limitations based upon trends in North Carolina in order to maximize legitimacy and relevancy of the requirements.

This template is not law, rather a carefully crafted guideline for cities and counties to consider when adopting ordinances specific to solar energy development in their jurisdiction. The authors of this template emphasize that the standards must be tailored to fit the existing local land development ordinances and suggest that ordinances treat solar similarly to other uses with similar attributes and land/community impacts. The zoning districts included in this template ordinance are generic districts which will need to be replaced with the existing zoning districts of the jurisdiction. The template ordinance may also be applied in non-zoned jurisdictions upon the modification and approval of the authorizing agency. Furthermore, the adoption of an ordinance will not supersede any existing federal, state, or local rules pertaining to the development of the project. There are many important aspects of solar development that are out of the jurisdiction of the city or county yet should be considered by the property owner, such as doing a title search to find out if there are any use restrictions of the parcel, such as would exist with an enhanced farm district or some easements. Additional guidance for landowners outside of the scope of this ordinance is provided in Appendix A. There several other appendices that provide related information but are not part of the template ordinance regulations, such the appendix on Sustainable Development (Appendix B) with information for planners and policy makers on additional options related to solar to consider in other development ordinances.

Stakeholders Available for Contact

The following selected members of the template ordinance working group have agreed to make themselves available for questions regarding the ordinance or issues related to solar development.

NC Solar Center (NCSC) Tommy Cleveland (919) 515-9432 Tommy_Cleveland@ncsu.edu	NC Sustainable Energy Association (NCSEA) Michael Fucci (302) 584-4152 fucci@energync.org
Duke Energy Bruce Barkley (919) 546-2814 Bruce.Barkley@duke-energy.com	Duke University Nicholas Institute Larry Shirley (919) 613-8745 Larry.Shirley@duke.edu
Federal Aviation Administration (FAA) Dana Perkins at Atlanta ADO in Working Group Aaron Braswell at Memphis ADO is best contact (901) 322-8192 Aaron.Braswell@faa.gov	Mathis Consulting Ben Edwards (828) 351-9631 ben@mathiscounseling.com
NC Conservation Network Nadia Luhr (919) 857-4699 ext.107 nadia@ncconservationnetwork.org	NC Department of Agriculture – Ag. Development & Farmland Preservation Dewitt Hardee (919) 707-3069 Dewitt.Hardee@ncagr.gov
NC Department of Agriculture – Agribusiness Development Ron Fish (919) 707-3119 Ron.Fish@ncagr.gov	NC Department of Commerce – Division of Community Assistance - Community Planning, Central Regional Office Oliver Bass (919) 571-4900 obass@nccommerce.com
NC DENR – Division of Energy, Mineral, & Land Resources - State Energy Program Bob Leker (919) 733-1907 bleker@nccommerce.com	NC DENR – Division of Water Quality (DWQ) Bill Diuguid (919) 807-6369 Bill.Diuguid@ncdenr.gov
NC Department of Revenue (Tax) Michael Brown (919) 814-1142 Michael.Brown@dorn.com	NC Farm Bureau Paul Sherman (919) 719-7292 Paul.Sherman@ncfb.org
NC League of Municipalities Kim Hibbard (919) 715-3936 khibbard@nclm.org	NC State University Forestry Department Mark Megalos (919) 513-1202 mamegalo@ncsu.edu

NC Wildlife Resources Commission Kacy Cook (910) 638-4887 Kacy.Cook@ncwildlife.org	Planner – Catawba County Susan Ballbach (828) 465-8381 sballbach@catawbacountync.gov
Planner – Cleveland County Chris Martin 704-484-4975 Chris.Martin@clevelandcounty.com	Planner – Granville County Dervin Spell (919) 603-1333 Dervin.Spell@granvillecounty.org
Planner – Guilford County Les Eger (336) 641-3635 leger@co.guilford.nc.us	Planner – Warren County Ken Krulik (252) 257-7027 ext.30 kkrulik@co.warren.nc.us
Solar Industry - Carolina Solar Energy Richard Harkrader (919) 682-6822 rharkrader@carolinasolarenergy.com	Solar Industry - Parker Poe Adams & Bernstein, LLP Katherine Ross (919) 835-4671 katherineross@parkerpoe.com
Solar Industry - PCG Solar/Green Guys Mike Whitson (704) 497-0367 mike@pcgsolar.com	Solar Industry - O₂Energies, Inc. Logan Stephens (336) 708-5161 logan@o2energies.com
Solar Industry - Spilman Thomas & Battle, PLLC Nathan Atkinson (363) 725-4496 natkinson@spilmanlaw.com	Solar Industry - Southern Energy Management Bob Kingery (919) 836-0330 ext 101 bkingery@southern-energy.com
Solar Industry - Strata Solar Lance Williams (919) 960-6015 ext 306 lwilliams@stratasolar.com	Solar Industry - QF Solutions Donna Robichaud (513) 659-1178 drobichaud@qf-solutions-llc.com
UNC School of Government Adam Lovelady (919) 962-6712 adamlovelady@sog.unc.edu	

Local government planning support resources:

- **NC Department of Commerce – Division of Community Assistance – Office of Community Planning:** To request services please contact the office nearest you. Contact information is available at www.nccommerce.com/cd/community-planning/regional-office-services
- **Solar Outreach Partnership (SolarOPs) – a US Department of Energy funded project:** Designed to help accelerate solar energy adoption on the local level by providing best practices, resources, and technical assistance to local governments. www.solaroutreach.org

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Template Solar Energy Development Ordinance

1. Purpose

The purpose of this ordinance is to facilitate the construction, installation, and operation of Solar Energy Systems (SESs) in the County/City of _____ in a manner that promotes economic development and ensures the protection of health, safety, and welfare while also avoiding adverse impacts to important areas such as agricultural lands, endangered species habitats, conservation lands, and other sensitive lands⁴. It is the intent of this ordinance to encourage the development of SESs that reduce reliance on foreign and out-of-state energy resources, bolster local economic development and job creation, support the diversification of the state's energy portfolio, strengthen energy and grid security, reduce greenhouse gas emissions, reduce local air and water pollution, and aid North Carolina in meeting its Renewable Portfolio Standard. This ordinance is not intended to abridge safety, health or environmental requirements contained in other applicable codes, standards, or ordinances. The provisions of this ordinance shall not be deemed to nullify any provisions of local, state or federal law.

2. Definitions

Solar Energy System (SES) - the components and subsystems required to convert solar energy into electric or thermal energy suitable for use. The area of the system includes all the land inside the perimeter of the system, which extends to any fencing. The term applies, but is not limited to, solar photovoltaic (PV) systems, solar thermal systems, and solar hot water systems. A system fits into one of three system types: Level 1 SES, Level 2 SES, and Level 3 SES.

Level 1 Solar Energy System - Level 1 SESs include the following:

- i. Roof-mounted on any code-compliant structure.
- ii. Ground-mounted on an area of up to 50% of the footprint of the primary structure on the parcel but no more than 1 acre.
- iii. Covering permanent parking lot and other hardscape areas.
- iv. Building integrated solar (i.e., shingle, hanging solar, canopy, etc.).

Level 2 Solar Energy System - Level 2 SESs are ground-mounted systems not included in Level 1 that meet the area restriction listed below:

- v. Agricultural/Residential: SES $\leq 1/2$ acres
- vi. Residential Low Density: SES $\leq 1/2$ acre
- vii. Residential Medium Density: SES $\leq 1/2$ acre
- viii. Residential High Density: SES $\leq 1/2$ acre
- ix. General Commercial/Business: SES ≤ 10 acres
- x. Light Industrial: SES of any size
- xi. Heavy Industrial: SES of any size
- xii. Office-Institutional: SES ≤ 10 acres

Level 3 Solar Energy System – Level 3 SESs are systems that do not satisfy the parameters for a Level 1 or Level 2 Solar Energy System.

⁴ See Appendix C for information on the NC resources

3. Applicability

- a. This ordinance applies to the construction of any new SES within the jurisdiction of the County/City.
- b. An SES established prior to the effective date of this ordinance shall remain exempt:
 - i. Exception: Modifications to an existing SES that increases the SES area by more than 5% of the original footprint or changes the solar panel type (e.g. photovoltaic to solar thermal) shall be subjected to this ordinance.
- c. Maintenance and repair are not subject to this ordinance.
- d. This ordinance does not supersede regulations from local, state, or federal agencies. Some important examples of such regulations include, but are not limited to:
 - i. **Building/Electrical Permits Required**
Nothing in this ordinance modifies already established building standards required to construct a SES.
 - ii. **Onsite Wastewater System Avoidance**
Nothing in this ordinance modifies already established Department of Health and Human Services requirements. A SES shall not be constructed over onsite waste water systems (e.g. septic systems) unless approved by the Department of Health and Human Services.
 - iii. **Stormwater Permit Required⁵**
Nothing in this ordinance modifies the requirements or exempts any SES of complying with the various stormwater jurisdictions⁶ and regulations established by the Department of Environment and Natural Resources. North Carolina statute requires the acquisition of stormwater permits for construction projects that impact stormwater runoff.
 - iv. **Historic Districts**
Nothing in this ordinance modifies already established State Historic Preservation Office requirements. May require additional permitting (certificates of appropriateness) to install solar in Historic Districts⁷

4. Permits Required

The type of permit required for an SES is displayed in Table 1: Permit Requirements.

⁵ See Appendix D: Water Infiltration and Soil Conservation for information on their relationship with ground-mounted solar energy systems

⁶ <http://portal.ncdenr.org/web/wq/ws/su/sw-permitting-map>

⁷ www.hpo.ncdcr.gov (see also: www.nrel.gov/docs/fy11osti/51297.pdf)

Table 1: Permit Requirements

Types of Permits Required: P= Permitted Use; D= Development Standards ⁸ ; SUP= Special Use Permit or Conditional Use Permit (see Appendix E)								
Zoning District	Agricultural/ Residential	Residential Low Density	Residential Med. Density	Residential High Density	Commercial/ Business	Light Industrial	Heavy Industrial	Office/ Institutional
Solar Energy Facilities								
Roof-mounted, parking lot cover, or building integrated (Level 1)	P	P	P	P	P	P	P	P
Ground-mounted:								
up to 50% of the footprint of the primary structure (Level 1)	P	P	P	P	P	P	P	P
≤1/2 acre (Level 2)	D	D	D	D	D	D	D	D
≤10 acres (Level 2 or 3)	SUP	SUP	SUP	SUP	D	D	D	D
>10 acres (Level 2 or 3)	SUP	SUP	SUP	SUP	SUP	D	D	SUP

5. Parcel Line Setbacks

The following table provides the Parcel Line setback to ground mounted SES equipment, excluding any security fencing, poles, and wires necessary to connect to facilities of the electric utility.

Table 2: Parcel Line Setbacks

Zoning District	Level 1	Level 2	Level 3		
			Front	Side	Rear
Agricultural/Residential	Per Zoning District*****	Per Zoning District* **	30’*	15’*	25’*
Residential, low density			50’*	50’*	50’*
Residential Medium Density			Per Zoning District*		
Residential High Density					
Commercial/Business			30’*	15’*	25’*
Light Industrial			30’*	15’*	25’*
Heavy Industrial			30’*	15’*	25’*
Office/Institutional			30’*	15’*	25’*
* 100’ setback for SES equipment, excluding any security fencing, to any residential dwelling unit. If the SES is on a working farm where the primary residential structure of the farm is on an adjacent lot then this 100’ setback will not apply to this primary residential structure.					
** Ground-mounted SES must comply with district front yard limitations and setbacks, or otherwise not impair sight distance for safe access to or from the property or other properties in the vicinity					
*** Level 1 SESs are not subject to screening requirements typically applied to accessory utility systems (HVAC, dumpsters, etc.).					

⁸ Referred to as “Limited Use” in some jurisdictions

6. Height Limitations

The height of systems will be measured from the highest natural grade below each solar panel.

Table 3: Height Limitations*

Zoning Districts	Level 1 ⁹	Level 2	Level 3
Agricultural/Residential	Roof-mounted: Per zoning district Ground-mounted: 20'	20'	20'
Residential, low density		20'	20'
Residential Medium Density		20'	20'
Residential High Density		20'	20'
Commercial/Business		20'	20'
Light Industrial		20'	20'
Heavy Industrial		20'	20'
Office/Institutional		20'	20'
* This excludes utility poles and any antennas constructed for the project.			

7. Aviation Notification (see Appendix F for additional information)

The requirements below apply only to Level 1, 2, & 3 systems over half (½) an acre in size:

- a. A map analysis showing a radius of five (5) nautical miles from the center of the SES with any airport operations within this area highlighted shall be submitted with permit application.
- b. For consideration of potential impacts to low altitude military flight paths, notification of intent to construct the SES shall be sent to the NC Commanders Council¹⁰ at least 30 days before the CUP/SUP hearing for Level 3 SESs and at least 45 days before starting construction for applicable Level 1 & Level 2 SESs. Notification shall include location of SES (i.e. map, coordinates, address, or parcel ID), technology (i.e. roof-mounted PV, ground-mounted fixed PV, tracked PV, solar thermal, etc.), and the area of system (e.g. 5 acres). Proof of delivery of notification and date of delivery shall be submitted with permit application.
- c. The latest version of the Solar Glare Hazard Analysis Tool (SGHAT)¹¹ shall be used per its user's manual to evaluate the solar glare aviation hazard. The full report for each flight path and observation point, as well as the contact information for the zoning administrator, shall be sent to the authority indicated below at least 30 days before the CUP/SUP hearing for Level 3 SESs and at least 45 days before starting construction for Level 1 & Level 2 SESs. Proof of delivery of notification and date of delivery shall be submitted with permit application.
 - i. Airport operations at airport in the National Plan of Integrated Airport Systems (NPIAS)¹² within 5 nautical miles of the center of SES: provide required information to the Federal Aviation Administration's (FAA) Airport District Office (ADO) with oversight of North Carolina¹³

⁹ An alternative for roof mounted systems would be to exempt roof mounted systems from building height restrictions.

¹⁰ Mail: Commanding General; Attn: Community Plans and Liaison (NC Commanders Council); Marine Corps Installations East (MCIEAST); PSC Box 20005; Camp Lejeune, NC 28542

Email: Subject: NC Commanders' Council Notification of Solar Development Project in "*Town or County Name*"

Address: Gray CIV Alexander K [alexander.gray@mcw.usmc.mil]

¹¹ <http://sandia.gov/glare>

¹² http://www.faa.gov/airports/planning_capacity/npias/reports/

¹³ as of October 2013 this is the Memphis ADO

- ii. Airport operations at airport *not* in the NPIAS, including military airports, within 5 nautical miles of the center of SES: provide required information to the NC Commanders Council for military airports and to the management of the airport for non-military airports

Any applicable SES design changes (e.g. module tilt, module reflectivity, etc.) after initial submittal shall be rerun in the SGHAT tool and the new full report shall be sent without undue delay to the contact specified in 7.b.i and 7.b.ii above for accurate records of the as-built system.

8. Level 1 Solar Energy System Requirements

Level 1 SESs are a permitted use provided they meet the applicable height, setback, aviation notification, and related district standards.

9. Levels 2 & 3 Solar Energy System Requirements

These requirements are in addition height, setback, aviation notification, and applicable district standards.

a. Site Plan

- i. A site plan¹⁴ shall be submitted to the Zoning Administrator demonstrating compliance with:
 1. Setback and height limitations established in Tables 2 and 3,
 2. Applicable zoning district requirements such as lot coverage,
 3. Applicable solar requirements per this ordinance.

b. Visibility

- i. SESs shall be constructed with buffering as required by the applicable zoning district or development standards (see Appendix J for solar visual buffering example standards).
- ii. Public signage (i.e. advertising, educational, etc.) as permitted by local signage ordinance, including appropriate or required security and safety signage.
- iii. If lighting is provided at site, lighting shall be shielded and downcast such that the light does not spill onto the adjacent parcel or the night sky. Motion sensor control is preferred.

c. Decommissioning (see Appendix G for a sample decommissioning plan and Appendix H for example abandonment clause and information on decommissioning)

- i. A decommissioning plan signed by the party responsible for decommissioning and the landowner (if different) addressing the following shall be submitted with permit application.
 1. Defined conditions upon which decommissioning will be initiated (i.e. end of land lease, no power production for 12 months, etc.)
 2. Removal of all non-utility owned equipment, conduit, structures, fencing, roads, and foundations
 3. Restoration of property to condition prior to development of the SES.
 4. The timeframe for completion of decommissioning activities.
 5. Description of any agreement (e.g. lease) with landowner regarding decommissioning.
 6. The party currently responsible for decommissioning.
 7. Plans for updating this decommissioning plan.
- ii. Before final electrical inspection, provide evidence decommissioning plan was recorded with the Register of Deeds.

¹⁴ Applicants may choose to provide a sketch plan to the Planning Administrator ahead of a site plan, as sketch plans do not require much investment and are an opportunity for the Planning Administrator to point out design changes ahead of more expensive site planning.

APPENDIX A: Landowner Guidance

There are many aspects of solar energy system development that impact the land, the landowner, the community, and the solar owner that are not regulated by the local government, or other regulatory bodies. Below is a list of issues developed in early 2013 in consultation with staff at the State Energy Office, the NC Solar Center, and the NC Attorney General's office to help identify *some* issues landowners should investigate when considering a lease offered for land used for a solar farm (the list is not meant to be a comprehensive list of all issues). It is recommended that landowners complete item #1 - get a land-lease lawyer.

1. It is highly recommended that you retain a lawyer with land lease experience to help you evaluate a lease. You can reach the NC Bar Association at 1-800-662-7660 and they can give you a list of lawyers in your area.
2. An option or feasibility period may be proposed by a developer while they are investigating whether a parcel of land is appropriate for a project – before they offer a long term lease. This is a due diligence period a developer will use to examine if the right conditions exist for a solar farm and possibly to secure agreements for the sale of power from the project.
3. Make sure conservation easement conditions or agricultural designation for tax purposes are consistent with the new lease. Taking land out of agricultural designation may result in additional taxes owed. The contract should state who is responsible for increased taxes due to the Solar Energy System development.
4. Evaluate any potential conflicts that the solar lease may have w/ any existing mortgage terms.
5. Evaluate any potential conflicts that the solar lease may have w/ any existing land use agreements, such as easements or an enhanced farm district.(A title search may be used to identify potential conflicts)
6. Make sure there is compensation for timber removal (if appropriate).
7. Make sure all conditions of a lease or options in advance of a lease are received in writing.
8. Have detailed decommissioning (removal) and restoration terms for the solar equipment at the end of lease so the land can be used for other purposes.
9. The developer should be responsible for managing storm water on the site. The installation of the arrays will impact storm water on the site and may require changes to storm water management or increase maintenance of storm water system (i.e. erosion control and keeping drainage ditches/pipes free flowing).
10. Make sure the lease identifies all work to be done and exact locations for equipment, also make sure there is proper notification of landowner in advance of any work to be done.
11. Take time to review lease documents before signing them.
12. It may be useful to check w/ neighbors to assess compensation rates being offered for land leases in your area.

Another resource that individuals as well as local governments may wish to consult is a document that the Solar Foundation prepared with funding from the U.S. Department of Energy as part of the US Department of Energy SunShot Program. It discusses a number of background requirements for solar farms as well as major elements of lease documents. You can find the document at the following link

http://thesolarfoundation.org/sites/thesolarfoundation.org/files/TSF_Leasing%20Fact%20Sheet.pdf

APPENDIX B: Sustainable Energy Options and Resources

This appendix is provided to supply planners and policy makers with inspiration and information about concepts and policies that in one way or another relate to solar energy, but do not appear within the scope of a solar development ordinance. None of the policies in this appendix are included in the template solar ordinance.

Project Permit – Solar Permitting map, database, and ratings, by Vote Solar

A project of the Vote Solar Initiative, Project Permit is an interactive website that scores municipal solar permitting practices nationwide. It is designed to help permitting staff, solar advocates, and municipal leaders understand how their city or town compares to permitting best practices. Project Permit includes tools and resources to help more municipalities achieve permitting best practices. Project Permit is funded by Solar 3.0, a DOE Sunshot Initiative grant recipient.

<http://projectpermit.org/>

Model Inspection Checklist for Rooftop PV Systems, from Interstate Renewable Energy Council (IREC), September 2013

For municipalities, an inspection checklist can serve a variety of important functions. First, it can serve as a supplementary educational tool for new or experienced inspectors to ensure they are aware of the host of code requirements that must be verified on-site during the inspection. It can also increase the consistency of inspections, by both a single inspector, as well as different inspectors working for the jurisdiction. Consistent inspections ensure high-quality, safe installations and also reduce conflict with installers, who may complain when they perceive that inspectors provide different results. The municipality can also use an inspection checklist as a tool for highlighting particular issues that seem to be repeatedly problematic for installers. For example, a checklist could contain a section for “common mistakes” which could highlight particular issues for both installers and inspectors to verify. The Model Inspection Checklist for Rooftop PV Systems was developed after reviewing existing checklists that have been created by leading jurisdictions across the United States. IREC incorporated the best components of each of these checklists and then worked with Don Hughes, Senior Electrical Inspector with Santa Clara County, California, to identify the relevant code requirements and add the citations. Finally, this document was peer-reviewed by qualified inspectors and building code officials from across the country, and by UL representatives.

www.irecusa.org/wp-content/uploads/2013/09/Model-Inspection-Checklist.pdf

Expedited Permit Process, from Solar American Board for Codes and Standards (Solar ABCs)

This report presents an Expedited Permit Process for PV Systems. The permit process in this report was created to meet the needs of the growing, small-scale photovoltaic (PV) market in the U.S. and is applicable nationwide. It takes advantage of the many common characteristics inherent in most of the small-scale PV systems installed today to streamline both the application and award of permits. The term “expedited permit process” refers to an organized permitting process by which a majority of small PV systems can be permitted (structural & electric) quickly and easily. It is not intended to apply to all types of PV systems. The primary need and use for this process is for systems of less than 15kW maximum power output. The expedited permit process is intended to simplify the structural and electrical review of a small PV system project and minimize the need for detailed engineering studies and unnecessary delays.

www.solarabcs.org/about/publications/reports/expedited-permit/

Solar Powering Your Community: A Guide for Local Governments, from U.S. Department of Energy

The U.S. Department of Energy developed this comprehensive resource to assist local governments and stakeholders in building sustainable local solar markets. This second edition of the guide was updated to include new market developments and innovations for advancing local solar markets that have emerged since the first edition was released in 2009. This updated edition also contains the most recent lessons and successes from the original 25 Solar America Cities and other communities promoting solar energy. The guide introduces a range of policy and program options that have been successfully field tested in cities and counties around the country.

This guide can help stimulate ideas or provide a framework for a comprehensive solar plan for a community. DOE recognizes that there is no one path to solar market development. This guide therefore introduces a range of policy and program options that can help a community build a local solar infrastructure. Communities can tailor their approach to fit their particular needs and market barriers.

www4.eere.energy.gov/solar/sunshot/resource_center/resources/solar_powering_your_community_guide_local_governments

NC Solar Access Law:

North Carolina has a Solar Access Law, which among other things, states that Cities and counties in North Carolina generally may not adopt ordinances prohibiting the installation of "a solar collector that gathers solar radiation as a substitute for traditional energy for water heating, active space heating and cooling, passive heating, or generating electricity for residential property. For more information visit:

www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=NC08R

Renewable Energy Ready Homes

Local governments can encourage construction of more capacity for rooftop solar installations on industrial, commercial and residential rooftops. The American Planning Association recommends that for this purpose local governments require the installation of solar ‘stub-ins’ on rooftops of appropriate new construction and building renovation. Stub-ins and their installation are very affordable and can significantly reduce the cost of installing a solar system in the future.

Energy Star has Renewable Energy Ready Homes specifications:

www.energystar.gov/index.cfm?c=rerh.rerh_index

Design for Solar Access

New developments can be designed to maximize solar access for each property, greatly increasing the ability of the buildings in the development to make use of solar energy.

Some resources:

- Site Design strategies for Solar Access in model Sustainable Community Development Code: www.law.du.edu/documents/rmlui/sustainable-development/SolarAccess.pdf and www.law.du.edu/images/uploads/rmlui/rmlui-sustainable-siteDesignStrategiesSolarAccess.pdf
- Solar Ready Development: <http://www.solarsimplified.org/zoning/solar-zoning-toolbox/solar-ready-zoning>
- APA Planning and Zoning for Solar Energy information packet: www.planning.org/pas/infopackets/open/pdf/30part1.pdf

Wildlife Friendly Power Lines

The U.S. Fish & Wildlife Service provides guidelines on how to minimize the impacts of distribution and transmission lines to wildlife at www.fws.gov/birds/documents/powerlines.pdf.

APPENDIX C: NC Resource Mapping and Information

The **Biodiversity and Wildlife Habitat Assessment map** can be obtained from the **N.C. Conservation Planning Tool** at www.conservationtool.nc.gov and displays the location of high priority habitats and natural resources. Also included in the N.C. Conservation Planning tool are maps of Open Space and Conservation Lands, Agricultural Lands, and Forestry Lands.

- The NC Wildlife Resources Commission recommends that Solar Energy System developers address how they will minimize impacts as much as is practical to forests and sensitive lands mapped in the Biodiversity and Wildlife Habitat Assessment.

Maps of Managed Areas (lands managed at least partially for wildlife habitat) and Smoke Awareness Areas (areas adjacent to lands managed with prescribed burning) are available from the **Green Growth Toolbox** website at www.ncwildlife.org/greengrowth (see below).

- The NC Wildlife Resources Commission recommends that Solar Energy System developers address how they will minimize impacts as much as is practical to forests and sensitive lands mapped in Managed Areas and impacts to the ability to conduct prescribed burning on adjacent lands. The NC Wildlife Resources Commission also recommends that sites should not be located immediately adjacent to Managed Areas.

NC OneMap (www.nconemap.org/) is a public service providing comprehensive discovery and access to North Carolina's geospatial data resources. NC OneMap, the State's Clearinghouse for geospatial information, relies on data sharing and partnerships. Information available is extensive and includes wetlands, soil types, streams, and airports.

NC DENR Watershed Plan Map: <http://portal.ncdenr.org/web/wq/ps/bpu/watershed-plan-map>

NC Green Growth Toolbox: Wildlife & Natural Resource Stewardship in Planning, from North Carolina Wildlife Resources Commission

The NC Green Growth Toolbox is a guide to provide North Carolina's counties, towns, and cities with tools for growth that conserves wildlife and natural resources. The Toolbox includes a Green Growth Handbook, Wildlife Action Plan, Conservation Data, Habitat Conservation Recommendations, Training Workshops, and more.

www.ncwildlife.org/Conserving/Programs/GreenGrowthToolbox.aspx

APPENDIX D: Water Infiltration and Soil Conservation at SES

The prevailing interpretation of ground-mounted solar energy systems is that the solar arrays do *not* count towards the impervious allowance. In other words, the solar arrays are pervious. The State definition of built-upon area states built-upon area does not include a wooden slatted deck or pervious or partially pervious paving material to the extent that the paving material absorbs water or allows water to infiltrate through the paving material.¹⁵ Therefore, if the solar panels can be constructed in such a manner as to promote the effective infiltration of rainfall then they could be considered pervious, similar to a slatted deck or pervious pavement. Other structures such as transformers, buildings, entrance roads, etc. would still be considered impervious. The following criteria could be used at a minimum in establishing a solar panel as pervious cover:

1. Panels must be positioned to allow water to run off their surfaces.
2. Soil with adequate vegetative cover must be maintained under and around the panels.
3. The area around the panels must be adequate to ensure proper vegetative growth under and between the panels.

It is suggested that the solar farm designer/developer design the ground cover as pervious to the maximum extent practicable, so that the stormwater infiltrates or is cleaned by sheetflow across the solar farm before exiting the property or reaching the waters of the State.

Information on soil conservation:

- North Carolina Division of Water Quality Best Management Practices (BMP) Design Manual (<http://portal.ncdenr.org/web/lr/bmp-manual>) details how to design various stormwater BMPs effectively.
- North Carolina Association of Soil & Water Conservation Districts (<http://ncaswcd.org/>)
- A sample (soil) conservation plan: http://www.dec.ny.gov/docs/water_pdf/appendixfl.pdf

¹⁵ State's model Phase II post-construction ordinance, Section 6: Definitions, Built-upon area (BUA)
<http://portal.ncdenr.org/web/lr/ms4-resources>

APPENDIX E: Conditional Use Permits and Special Use Permits

Special Use Permits (aka Conditional Use Permits) require a quasi-judicial hearing where the application must be found to meet several general standards and any special conditions required by the board. In general, decisions of a quasi-judicial body require findings of facts to reach conclusions of law that justify the decision. Decisions of a quasi-judicial body are often legally enforceable under the laws of a jurisdiction; they can be challenged in a court of law which is the final decisive authority

Most NC jurisdiction use the following four general standards: 1) Does not materially endanger the public health or safety; 2) Meets all required conditions and specifications; 3) Would not substantially injure the value of adjoining property or be a public necessity, and 4) Will be in harmony with the area in which it is located and be in general conformity with the comprehensive plan. More information on SUP/CUP in NC is available from the UNC School of Government: http://www.sog.unc.edu/sites/www.sog.unc.edu/files/SS_22_v4b.pdf

APPENDIX F: Airports

Experience and research has shown that there is a possibility for today's solar energy systems to cause a glare hazard for pilots and/or air traffic controllers. The Department of Energy's Sandia National Laboratories recently developed a 3-D modeling based online hazard assessment tool to determine if a solar project is likely to create a Solar Glare Aviation Hazard. The tool is free and recommended by the Federal Aviation Association (FAA). <https://share.sandia.gov/phlux>. Contact the FAA's local Airport District Office (ADO) for help with the tool or to get input data for tool variables that must come from the airport.

A new FAA interim policy¹⁶ (published 10-23-2013) for on-airport solar development requires the use of this glare assessment tool and defines the below criteria to assess acceptable risk of glare.

The proposed solar energy system meets the following standards:

1. No potential for glint or glare in the existing or planned Airport Traffic Control Tower (ATCT) cab, and
2. No potential for glare or "low potential for after-image" (shown in green in [reports]) along the final approach path for any existing landing threshold or future landing thresholds (including any planned interim phases of the landing thresholds) as shown on the current FAA-approved Airport Layout Plan (ALP)¹⁷. The final approach path is defined as two (2) miles from fifty (50) feet above the landing threshold using a standard three (3) degree glidepath.

The following are recommended steps required to complete the aviation notification requirement in the template solar ordinance for NC for SESs near an airport.

- 1) OFF AIRPORT solar project-
 - a) Determine if you are required to submit a filing with the Federal Aviation Administration (FAA) in accordance with CFR Title 14 Part 77.9 & follow instructions (<https://oeaaa.faa.gov/oeaaa/external/gisTools/gisAction.jsp?action=showNoNoticeRequiredToolForm>)
 - b) Use internet/software mapping tool (such Google Earth or Google Map) to identify airports within 5 nautical miles of the center of the proposed solar project site.
 - c) If search results indicate no airport within 5 nautical miles of the project site, append research results to the permit application.
 - d) If search results indicate airport(s) within 5 nautical miles of the project site, go to www.faa.gov/airports/planning_capacity/npas/reports/media/2013/npas2013AppendixBPart4.pdf to determine if it is in the National Plan of Integrated Airport Systems (NPIAS), i.e. an FAA "obligated" airport. If you are unable to determine if the airport is in the NPIAS or require assistance, contact the FAA's local ADO.
 - i) Notification of airports in the NPIAS should be sent to the local ADO.
 - ii) Notification of military airports should be sent to the NC Commander's Council via mail or email
 - iii) Notification of all other airports should be sent to the management of the airport¹⁸
 - e) Run the latest version of the SGAHT according to the user manual. Unless otherwise directed in the user's manual, use the tool to assess for glare hazards at¹⁹:
 - i) the Airport Traffic Control Tower (ATCT) cab, and

¹⁶ <http://www.gpo.gov/fdsys/pkg/FR-2013-10-23/pdf/2013-24729.pdf>

¹⁷ FAA airport GIS maps and eALPs at <https://airports-gis.faa.gov/public/>

¹⁸ NC airports in NC contact information at www.faa.gov:

http://www.faa.gov/airports/airport_safety/airportdata_5010/menu/contacts.cfm?Region=ASO&District=&State=NC&County=&City=&Use=&Certification=

¹⁹ Sources of NC airport data: Unofficial Airport information available under *Maps and Diagram* at

<http://flightaware.com/resources/airport/browse/NC> and official GIS maps at <https://airports-gis.faa.gov/public/>

- ii) the final approach path for any existing landing threshold or future landing thresholds (including any planned interim phases of the landing thresholds) as shown on the current FAA-approved Airport Layout Plan (ALP). The final approach path is defined as two (2) miles from fifty (50) feet above the landing threshold using a standard three (3) degree glidepath.
- f) Review and send the results summary as well as the results of the glare analysis tool for each flight path and the ATCT.

On-airport solar projects at FAA obligated airports must follow FAA requirements. The following are recommended steps to facilitate meeting the FAA requirements.

2) ON AIRPORT Solar Projects

- a) Contact the ADO to discuss big picture concept (type of system, siting, size, environmental requirements, FAA Form 7460, etc.). This way FAA can give the proponent a general “roadmap” for the way forward (General FAA areas of concern, introduce the SGHAT Tool, if an on-airport project: give a feel for which areas ON AIRPORT can be considered for siting (per FAA safety & design standards); lease requirements on obligated airports, etc. Also, the ADO can facilitate contact between the solar proponent, the sponsor (& NCDOA if project location is on or near a State Block airport. In this case the ADO will be available to support NCDOA as requested.
- b) If after preliminary discussion, the solar proponent is still interested, collaborate with the FAA (or NCDOA) until conceptual agreement by all parties with the FAA’s lease requirements.
- c) Develop National Environmental Policy Act (NEPA) documentation to support siting alternatives & run the SGHAT Tool for all site alternatives carried forward for analysis.
- d) Submit 7460 with Proposed Lease, NEPA analysis & SGHAT Tool Results attached to FAA ADO Review & acceptance via Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) filing.

Limited information on low altitude flight paths in North Carolina.

Information about military airports and low altitude flight paths may be found in a 2012 report on military presence and land compatibility: 2012 NC Military Land Compatibility Report http://portal.ncdenr.org/c/document_library/get_file?p_l_id=1169848&folderId=8979146&name=DLFE-57386.pdf. Local planning departments may have or be able to request maps of local low altitude flight paths.

APPENDIX G: Example Decommissioning Plan

This is a simple example decommissioning plan:

Decommission Plan for Big Bright Solar Farm

September 10, 2013

Prepared and Submitted by Solar Developer ABC, the owner of Big Bright Solar Farm

As required by the Town/County of _____, Solar Developer ABC presents this decommissioning plan for Big Bright Solar Farm (the "Facility").

Decommissioning will occur as a result of any of the following conditions:

1. The land lease ends
2. The system does not produce power for 12 months
3. The system is damaged and will not be repaired or replaced

The owner of the Facility, as provided for in its lease with the landowner, will do the following as a minimum to decommission the project.

1. Remove all non-utility owned equipment, conduits, structures, fencing, and foundations to a depth of at least three feet below grade.
2. Remove all graveled areas and access roads unless the owner of the leased real estate requests in writing for it to stay in place.
3. Restore the land to a condition reasonably similar to its condition before SES development, including replacement of top soil removed or eroded.
4. Revegetate any cleared areas with warm season grasses that are native to the region (~~Mountains, Piedmont, Sandhills or Coastal Plain~~ regions), unless requested in writing by the owner of the real estate to not revegetate due to plans for agricultural planting.

All said removal and decommissioning shall occur within 12 months of the facility ceasing to produce power for sale.

The owner of the Facility, currently Solar Developer ABC, is responsible for this decommissioning. Nothing in this plan relieves any obligation that the real estate property owner may have to remove the facility as outlined in the Special Use Permit in the event the operator of the farm does not fulfill this obligation.

The owner of the Facility will provide Town/County planning department and the Register of Deeds with an updated signed decommissioning plan within 30 days of change in the Facility Owner.

This plan may be modified from time to time and a copy of any modified plans will be provided to the planning staff and filed with the Register of Deeds by the party responsible for decommissioning.

SES Owner Signature: _____ Date: _____

Landowner (if different from SES Owner) Signature: _____ Date: _____

APPENDIX H: Abandonment & Decommissioning

This sample abandonment clause is provided for any jurisdiction who would like to consider including a clause on abandonment in their solar ordinance.

Abandonment

A SES that ceases to produce energy on a continuous basis for 12 months will be considered abandoned unless the current responsible party (or parties) with ownership interest in the SES provides substantial evidence (updated every 6 months after 12 months of no energy production) to the Zoning Administrator of the intent to maintain and reinstate the operation of that facility. It is the responsibility of the responsible party (or parties) to remove all equipment and facilities and restore the Parcel to its condition prior to development of the SES²⁰

1. Upon determination of abandonment, the Zoning Administrator shall notify the party (or parties) responsible they must remove the SES and restore the site to its condition prior to development of the SES within three hundred and sixty (360) days of notice by the Zoning Administrator.
2. If the responsible party (or parties) fails to comply, the Zoning Administrator may remove the SES, sell any removed materials, and initiate judicial proceedings or take any other steps legally authorized against the responsible parties to recover the costs required to remove the SES and restore the site to a non-hazardous condition.

Some resources regarding decommissioning of SES

- First Solar (leading manufacturer of Cadmium Telluride PV modules) has a pre-funded recycling program for all of their modules: www.firstsolar.com/Sustainability/Environmental/Recycling-Service
- PV Cycle (<http://www.pvcycle.org/>) European PV recycling program. A good source for an example of a large scale PV module recycling program and for information on PV recycling.
- Solar Energy Industries Association (SEIA) information on PV recycling: <http://www.seia.org/policy/environment/pv-recycling>
- NC DENR information on electronics recycling in NC
- Silicon Valley Toxics Coalition (SVTC) Solar Scorecard: <http://www.solarscorecard.com>
- Green Guys, company in NC offering recycling services to the solar industry
greenguys@pcgsolar.com

Current US PV Module Recycling Regulation:

End-of-life disposal of solar products in the US is governed by the Federal Resource Conservation and Recovery Act (RCRA), and state policies that govern waste. To be governed by RCRA, panels must be classified as hazardous waste. To be classified as hazardous, panels must fail to pass the Toxicity Characteristics Leach Procedure test (TCLP test). Most panels pass the TCLP test, and thus are classified as non-hazardous and are not regulated.

²⁰ Anywhere reference is made to restoring the parcel to condition prior to development of the SES (including removal of gravel, roads, and fencing), less restoration is acceptable when it is requested in writing by the parcel owner.

APPENDIX I: Solar PV and Fire Safety

Information on firefighter safety and emergency response needs

- Solar Energy Industries Association (SEIA) information on fire safety and solar: <http://www.seia.org/policy/health-safety/fire-safety-solar>
- Underwriters Laboratory (UL) information and studies on fire safety and solar: <http://www.ul.com/global/eng/pages/offerings/industries/buildingmaterials/fire/fireservice/pvsystems/>
- California Office of the State Fire Marshal information for firefighters on solar PV: http://www.gosolarcalifornia.ca.gov/solar_basics/fire_safety.php
- The Solar America Board for Codes and Standards (Solar ABCs) reports and information on fire and flammability for the solar PV industry and code officials: <http://www.solarabcs.org/current-issues/fire.html>
- Detailed Fire Protection Plan for solar farm in San Diego County, CA: http://www.sdcountry.ca.gov/pds/regulatory/docs/3300-11-029_CEQA_REVIEW_120503/3300-11-029-FPP.pdf
- Online training on Solar for the fire and rescue community, provided by the North Carolina Office of State Fire Marshal: http://www.ncdoi.com/OSFM/RPD/pt/Student_Review.aspx
- The 2012 version of the International Fire Code added requirements regarding roof-mounted and ground-mounted PV systems, including:
 - Marking: required on interior and exterior of direct-current (DC) conduit, enclosures, etc.
 - Locations of DC conductors: requirements regarding the location and pathway of DC wiring on and under a roof
 - Access and pathways: Module location restrictions designed to allow safe walkways and access for roof venting
 - Ground-mounted photovoltaic arrays: States that the access and pathway rules do not apply to ground-mounted systems, but they are required to provide a clear, brush-free area of 10 feet around the array.

This is section 605.11: Solar photovoltaic power systems in the International Fire Code, the exact language is available here:

http://publicecodes.cyberregs.com/icod/ifc/2012/icod_ifc_2012_6_par132.htm

APPENDIX J: Visual Buffering: Example NC Requirements

Visual buffering and screening is not specific to solar and has applicability to many other forms of development. However, solar has been subject to various screening/buffering standards of varying specificity throughout the state. The following are examples of buffering requirements in two jurisdictions (Brunswick and Guilford Counties) in the state at the time of publication of this template solar ordinance. In both cases there is a simple solar specific buffering requirement that refers to existing generic buffering specifications/requirements. Significant portions of the applicable county buffering specifications are included in this appendix to facilitate understanding the solar buffering requirement in each example.

Brunswick County

(UDO- Section 5.3.4.P)

Solar Farm (Rev. 01-Nov-10)

A Solar Farm developed as a principal use shall be permitted in accordance with Section 5.2., subject to the following:

...

3) Visibility

- (a) Solar farms with panels located at least 150 feet from an adjacent public street right-of-way, residentially-zoned property, or residential use shall not require screening.
- (b) Solar farms with panels located less than 150 feet from an adjacent public street right-of-way must meet the requirements of Section 7.2.8.B. Street Buffers and Section 7.2.9. Project Boundary Buffers.

(Section 7.2.8.B. Street Buffers and Section 7.2.9. Project Boundary Buffers.)

7.2.8. Street Buffers

Street buffers shall be required and existing vegetation should be used to satisfy these planting requirements where possible (see Section 7.1.5, Existing Vegetation). No vegetation or fence shall interfere with a required clear sight triangle at a driveway or intersection (See Section 6.2.4). Berms constructed in accordance with Section 7.2.10.B, Berms with Vegetation, are encouraged as a component of any street buffer and the Planning Director may allow up to 25% reduction in the required buffer depth with a berm.

....

B. Collector or Thoroughfare Street Buffers

All development located along either a collector or thoroughfare street shall be required to provide one of the following buffers along the entire street frontage.

1. One canopy tree per 100 linear feet of property frontage, located within a twenty-foot landscape buffer; OR
2. Two understory trees per 100 linear feet of property frontage, located within a twenty-foot landscape buffer; OR
3. Under utility lines only, two understory trees per 100 linear feet of property frontage, located within a 20-foot landscape buffer. No trees under utility lines shall have a natural height over 25 feet.

7.2.9. Project Boundary Buffers

Commentary: Project Boundary Buffers ensure a landscaped transition between different types of uses and/or zoning districts. At first glance, the following method may seem complicated. In reality, this is a fairly easy approach to implement. A few simple steps will provide the total amount of plants that are required to be in a buffer as well as the buffer depth.

A. Required Project Boundary Buffer Table

1. Description

- The buffer standards in the table below address the opacity of the buffer that is required on the property boundary between zoning districts, and in some instances within a zoning district.
- An opacity of 0.2 screens 20% of an object, and an opacity of 1.0 would fully screen the adjoining development during summer months after five years of growth.

2. Measurements: Project boundary buffers shall be measured along a perpendicular line from the lot line.

3. How to Read the Buffer Table

- The required opacity of project boundary buffers is represented in the Table below by two numbers (for example, .2/.6).
- The second number represents the total required buffer opacity between any two properties.
- Where the proposed project adjoins vacant property, the first number represents the applicant's required buffer opacity.
- Where the adjoining property is already developed with no buffer, the proposed project is responsible for providing the total required opacity (the second number).
- Where the adjoining property is already developed with a partial buffer, the proposed project is responsible for providing the remaining opacity required.
- A zero means no project boundary buffer is required.

ZONING DISTRICT of SUBJECT PROPERTY	ZONING DISTRICT of ADJOINING PROPERTY						
	Rural Low Density Residential	R-7500, R-6000, and SBR-6000	MR-3200 and N-C	C-I	C-LD and RU-I	I-G	
Rural Residential	0 ¹ /0 ²	.2/.2	.4/.6	.2/.8	.2/.8	.2/1.0	
R-7500, R-6000, and SBR-6000	.2/.2	0 ¹ /0 ²	.2/.4	.2/.6	.2/.6	.2/1.0	
MR-3200 and N-C	.4/.6	.2/.4	0 ¹ /0 ²	.2/.6	.2/.6	.2/1.0	
C-I	.6/.8	.4/.6	.4/.6	0/0	.2/.4	.2/1.0	
C-LD and RU-I	.6/.8	.4/.6	.4/.6	.2/.4	0/0 ²	.2/1.0	
I-G	.8/1.0	.8/1.0	.6/1.0	.6/1.0	.4/.6	0/0	
¹ Non-residential uses locating next to vacant property shall be required to provide a 0.2 buffer. ² When locating a non-residential use in a Rural Residential, R-7500, R-6000, SBR-6000, MR-3200, NC, C-LD, or RU-I Zoning District next to an existing residential developed property, a 0.4 buffer shall be required. Non-residential uses locating next to other non-residential uses are not required to provide a buffer.							

4. Buffer Alternatives

The table below shows the required buffer depth (average) and plantings required for a project boundary buffer to satisfy the required opacity. Existing vegetation should be used to satisfy these planting requirements where possible (see Section 7.1.5, Existing Vegetation).

MINIMUM REQUIRED PROJECT BOUNDARY BUFFER Buffer Depth and Plants Required Per 100 Linear Feet				
Required Opacity[1]	Alternative 1 Plantings	Alternative 2 Plantings	Alternative 3 Plantings + 6-Foot (Height) Fence[2]	Alternative 4 Plantings + 6-Foot (Height) Wall[3]
0.2	10 feet 1 canopy 1 understory 7 shrubs	10 feet 1 canopy 2 understory 3 shrubs	Not available	Not available
0.4	20 feet 2 canopy 4 understory 25 shrubs	20 feet 2 canopy 6 understory 9 shrubs	Not available	Not available
0.6	30 feet 3 canopy 6 understory 34 shrubs	30 feet 3 canopy 8 understory 13 shrubs	20 feet width 0 canopy 3 understory 3 shrubs	15 feet width 0 canopy 3 understory 3 shrubs
0.8	50 feet 5 canopy 7 understory 43 shrubs	50 feet 4 canopy 10 understory 17 shrubs	35 feet width 0 canopy 5 understory 7 shrubs	25 feet width 0 canopy 5 understory 7 shrubs
1.0	80 feet 5 canopy 8 understory 49 shrubs	80 feet 4 canopy 11 understory 19 shrubs	60 feet width 0 canopy 5 understory 7 shrubs	40 feet width 0 canopy 5 understory 7 shrubs
Note: [1] Required Opacity x 100 = % Required Opacity (e.g., .2 times 100 = 20% Required Opacity). [2] When Alternative 3 is selected, the fence type must be 100% opaque and comprised of either wooden or vinyl material. [3] When Alternative 4 is selected, the wall must be designed in conformance with Section 6.8.5, Walls, and Section 7.2.10, Walls, Berms, and Fences within Buffers.				

Commentary: Suppose you are required to install a buffer with opacity of 0.6 and you elect to use Alternative 1. Your buffer would have to be 30 feet deep (on average) and you would have to plant 3 canopy trees, 6 understory trees, and 34 shrubs for every 100 feet of buffer length.

For full requirements: http://www.brunswickcountync.gov/Portals/0/BC/files/Planning/UDO_Final.pdf

Guilford County

6.4-84 - Solar Collectors (Principal)

- (D) *Screening:* Solar collectors and associated outside storage shall be completely screened with a vegetative buffer from view from all streets and adjacent residential uses. Required screening shall be at a type B Planting Yard Rate, except understory-trees may be substituted for canopy tree requirements.”

6-3.2. - Planting Yards.

(B) *Planting Area Descriptions:*

- (4) Type B Planting Yard: A medium density screen intended to partially block visual contact between uses and create spatial separation. See Figure 6-G.

Planting Yard Rates						
Yard Type	Minimum Width (ft.)	Min. Avg. Width (ft.)	Maximum Width (ft.)	Canopy Tree Rate	Understory Tree Rate	Shrub Rate
Street Yard	8	8	25	$\frac{2}{100}$ lf; ^{sup} / _{sup} ;	NA ^c	17/100 lf
Type A Yard	40 ^a	50 ^a	75	$\frac{4}{100}$ lf/oc	10/100 lf/oc	33/100 lf/oc
Type B Yard	25 ^a	30 ^a	50	$\frac{3}{100}$ lf	5/100 lf	25/100 lf
Type C Yard	15 ^a	20 ^a	40	$\frac{2}{100}$ lf; ^{sup} / _{sup} ;	$\frac{3}{100}$ lf	17/100 lf
Type D Yard	5	5	10	-	$\frac{2}{100}$ lf	18/100 lf

Notes:

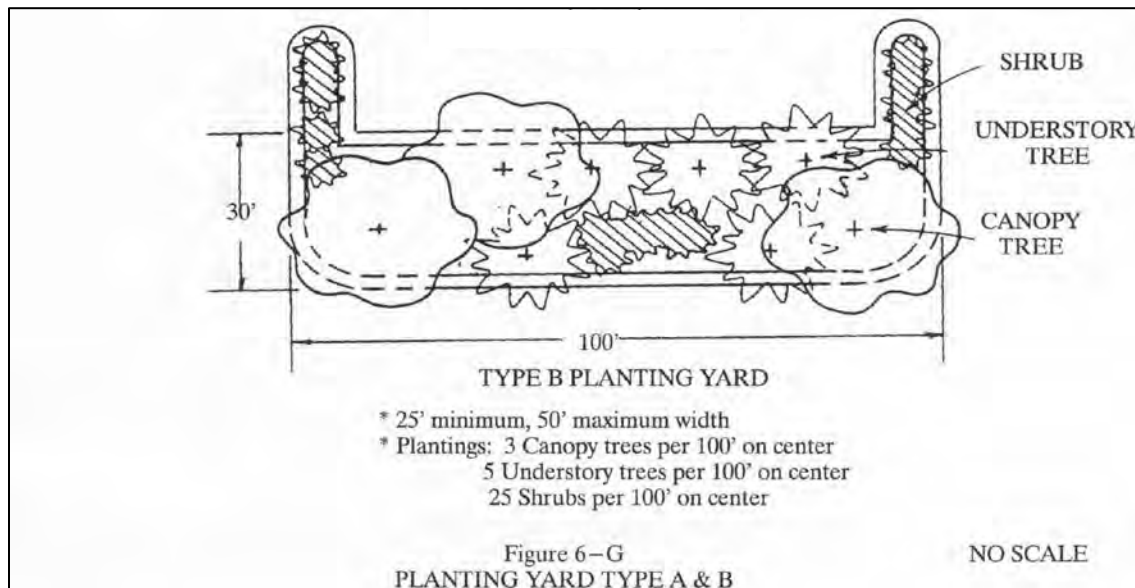
If: linear fee oc: on center

^a Walls, a minimum of five (5) feet in height, constructed of masonry, stone, or pressure treated lumber or an opaque fence, a minimum of five (5) feet in height, may be used to reduce the widths of the planting yards by ten (10) feet.

^{sup}/_{sup}; In streetyards, Type C and Type D planting yards, and parking lots understory trees may be substituted for canopy trees at the rate of two (2) understory trees for each required canopy tree.

^c One (1) understory tree may be substituted for each required canopy tree if the Technical Review Committee determines that there would be a major conflict with overhead utility lines.

NOTE: On Lots of Record less than fifty-five thousand (55,000) square feet in area, no development shall be required to place required landscaping on greater than fifteen (15) percent of the site.



6-3.7. - Provisions for Preservation of Existing Trees.

- (A) *General:* Any existing tree or group of trees which stands within or near a required planting area and meets or exceeds the standards of this Ordinance may be used to satisfy the tree requirements of the planting area. The protection of tree stands, rather than individual trees, is strongly encouraged.

For Full requirements go to Guilford Co. at <http://www.municode.com/Library>

These are two representative buffering requirements for solar found within North Carolina. As is evident, there are variances in descriptiveness and the level of intensity for each jurisdiction. This template ordinance does not favor these over any other alternatives. Appropriate requirements should be discussed and agreed upon by each jurisdiction.

APPENDIX K: Construction Waste Management Plan (CWMP)

Solar energy is generally considered an environmentally beneficial industry; however, its initial construction can produce large quantities of cardboard, wood, scrap metal, scrap wire, and clearing and grading wastes. Often the waste produced is sent to local landfills or burned on site. For level 2 and 3 SESs, these additional waste streams can place a burden on existing waste management and landfill resources at a local municipal and county level. A large percentage of this waste can be diverted from landfills to private recycling businesses with net costs approximating landfill disposal. According to a report published in 2010 by the North Carolina Department of Environment and Natural Resources (NCDENR) Division of Environmental Assistance and Outreach and the Recycling Business Assistance Center, the recycling industry in North Carolina consisted of over 630 private sector recycling businesses employing over 15,200 people and has been growing at 4.8% since 2008 (See Resources for link). In addition, NCDENR has launched a web based NC Recycling Markets Directory (see Resources below) to help identify local recyclers. As a result, developing a CWMP and finding a private recycling entity for construction waste(s) is arguable easier than ever before. Counties/municipalities that choose to adopt CWMP requirements can not only avoid straining their existing landfill and waste management resources, but can also help contribute to the growth of their local recycling industries. Similar ordinances requiring CWMPs for new construction have been ratified in California as well as Cook County, Illinois and King County, Washington (See below for further information)

CWMP Examples

- CALGREEN CWMP
 - <http://www.hcd.ca.gov/codes/calgreen/CW-1.pdf>
- Sandia National Laboratories CWMP Template
 - www.sandia.gov/engstds/ConstSpecs/Div_01/01505C_CWM_Waste_Mgt_Plan_Template-archived.pdf
- King County, Washington
 - <http://your.kingcounty.gov/solidwaste/greenbuilding/specifications-plans.asp>

Successful Construction Waste Management Ordinances

- State of California's California Building Standard Code
 - http://www.documents.dgs.ca.gov/bsc/CALGreen/2010_CA_Green_Bldg.pdf
- Cook County, Illinois - Ordinance requiring management of construction and demolition waste consistent with Cook County's existing Solid Waste Management Plan.
 - <http://blog.cookcountyil.gov/sustainability/wp-content/uploads/2012/07/Substitute-Demolition-Debris-Diversion-Ordinance-July-23.pdf>

Level 3 SES Anticipated Waste - 20 MW SES in Halifax County

- Project goal to recycle 80% of all construction and demolition waste. Contact greenguys@pcgsolar.com for more information.
 - 140,000 lbs - cardboard waste
 - 32,000 lbs - scrap wire waste
 - 3,500 - wooden slatted pallets
 - 16 acres - Clearing and grading waste

Resources

- NC Recycling Market Directory
 - <http://www.p2pays.org/dmrm/start.aspx>
- California Department of Housing and Community Development- Construction Waste Management Forms
 - <http://www.hcd.ca.gov/calgreen.html>
- Green Guys - Waste Management and Site Services greenguys@pcgsolar.com
- Employment Trends in NC Recycling Industry - 2010
 - <http://www.container-recycling.org/assets/pdfs/jobs/EmploymentTrendsInNC.pdf>

General Template for Rules and Regulations

1. A developer of a Solar Plant in North Carolina shall be required to develop a Waste Stream Management Plan (WSMP) for the construction waste and debris at the site of the said Solar Energy System.
2. A developer of a Solar Plant in North Carolina shall be required to file the WSMP with the department of _____ in the County/Town/City wherein the Solar Energy System shall be erected and operated.
3. A WSMP shall only be acceptable if it contains a proper and adequate plan for the recycling of _____ (____%) percent of all of the waste, including but not limited to cardboard, wood, scrap metal, scrap wire, and clearing and grading wastes, from the construction site.
4. A developer shall be required to file with the department of _____ in the County/Town/City wherein the Solar Energy System shall be erected a Construction and Demolition Debris Summary Report (CDSR) within fifteen (15) days of the end of the construction of the solar plant.

General Template for Enforcement

1. Developer's failure to meet or exceed the provisions of the developer's CWMP shall constitute a violation of this Ordinance.
2. Developer shall have fifteen (15) days in which to cure this violation and make property notice to the County/Town/City.
3. Developer's failure to cure and notify the County/Town/City within the said fifteen-day (15) period shall result in a fine of _____ (\$ insert dollar amount here) dollars to be paid by Developer within thirty (30) days of the issuance of said fine or a lien will be placed on the property upon which the solar energy system has been constructed.

APPENDIX L: Template Solar Ordinance Working Group Participants

Argand Energy, Rob Lease	NC Dept. of Environment & Natural Resources
Black and Veatch, Paul Brucke	(DENR), Natalie Birdwell
Buncombe County Planning Department, Josh O'Conner	NC Dept. of Environment & Natural Resources
Carolina Solar Energy, Richard Harkrader	(DENR), Layla Cummings
Catawba County Planning Department, Susan Ballach	NC Farm Bureau, Paul Sherman
Cleveland County Planning Department, Chris Martin	NC Forestry Association, Bob Schaefer
DENR- Division of Water Quality, Bill Diuguid	NC League of Municipalities, Kim Hibbard
Dominion Power, Michael Thompson	NC Regional Councils, Betty Huskins
Duke Energy Progress, Bruce Barkley	NC Sierra Club, Dustin Chicurel-Bayard
Federal Aviation Association, Peter Hughes	NC State University Cooperative Extension, Mary Lou Addor
Federal Aviation Association, Dana Perkins	NC Wildlife Resources Commission, Kacy Cook
Governor's office military affairs, John Nicholson	NCSU Forestry, Mark Megalos
Granville County Planning Department, Dervin Spell	Nicholas Institute for Environmental Policy
Guilford County Planning Department, Les Eger	Solutions, Larry Shirley
HelioSage LLC, Kyle West	North Carolina Solar Center, Tommy Cleveland
Institute for Emerging Issues, Diane Cherry	North Carolina Sustainable Energy Association,
Keyes, Fox, Weidman, Laurel Passera	Miriam Makhyoun
Mathis Consulting, Ben Edwards	North Carolina Sustainable Energy Association,
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NC Association of County Commissioners, Kevin Leonard	O2 Energies, Logan Stephens
NC Association of County Commissioners, Johanna Reese	Parker Poe, Katherine Ross
NC Association of County Commissioners, Casandra Skinner	PCG Solar, Mike Whitson
NC Chapter of American Planning Association, Ben Hitchings	PCG Solar, John Galloway
NC Chapter of the Association of Consulting Foresters, Greg Conner	PCG Solar, William Lee
NC Commerce Dept. - Community Planning, Betsy Kane	Progress Energy, Kendal Bowman
NC Commerce Dept. - Community Planning, Oliver Bass	Public Staff - North Carolina Utilities Commission,
NC Conservation Network, Nadia Luhr	Jay Lucas
NC DENR - Military Affairs and Strategic Planning, Chris Russo	QF Solutions, Donna Robichaud
NC Dept. of Agriculture - Agribusiness Development, Ron Fish	SEPI Engineering and Construction, Jerry Beckman
NC Dept. of Agriculture - Environmental / ADFP Programs, Dewitt Hardee	Smith Moore Leatherwood LLP, Beth Trahos
NC Dept. of Environment & Natural Resources (DENR), Trina Ozer	Southern Alliance for Clean Energy, Charlie Coggeshall
	Southern Energy Management, Bob Kingery
	Southern Energy Management, Will Etheridge
	Spilman Thomas & Battle, PLLC, Nathan Atkinson
	State Energy Program, Bob Leker
	Strata Solar, Lance Williams
	UNC School of Government, Adam Lovelady
	USMC, Michael Evers
	USMC, MCIEAST, Paul Friday
	Warren County Planning Department, Ken Krulik
	Waxhaw Planning Department, Lisa McCarter

WESTERN PENNSYLVANIA ROOFTOP SOLAR CHALLENGE

Final Solar Zoning Ordinance

Prepared for
PennFuture

Prepared by
Environmental Planning and Design, LLC

10/23/2012

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Western Pennsylvania Rooftop Solar Challenge

PennFuture

EPD, LLC

10/23/12

WESTERN PENNSYLVANIA ROOFTOP SOLAR CHALLENGE
MODEL ORDINANCE FOR
ON-SITE USAGE OF SOLAR PHOTOVOLTAIC SYSTEMS

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

Ordinance No. _____

[*Effective Date/Date Enacted*] _____

An Ordinance to amend the Zoning Ordinance of [*Municipality name*] by modifying [*Article/Section*], Definitions, by adding definitions for solar photovoltaic systems and by amending [*Article/Section*], by incorporating new sections to permit certain solar photovoltaic systems as accessory uses in any zoning district and by revising [*Article/Section*], by adding provisions for the permitting of certain solar photovoltaic systems.

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

Section 1. Definitions.

Array: Any number of electrically connected photovoltaic (PV) modules providing a single electrical output.

Building-Integrated System: A solar photovoltaic system that is constructed as an integral part of a principal or accessory building or structure and where the building-integrated system features maintain a uniform profile or surface of vertical walls, window openings, and roofing. Such a system is used in lieu of a separate mechanical device, replacing or substituting for an architectural or structural component of the building or structure that appends or interrupts the uniform surfaces of walls, window openings and roofing. A building-integrated system may occur within vertical facades, replacing view glass, spandrel glass or other facade material; into semitransparent skylight systems; into roofing systems, replacing traditional roofing materials; or other building or structure envelope systems.

Building-Mounted System: A solar photovoltaic system attached to any part or type of roof on a building or structure that has an occupancy permit on file with the [*Municipality/Township/Borough*] and that is either the principal structure or an accessory structure on a recorded [*lot/parcel/property*]. This system also includes any solar-based architectural elements.

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Cell: The smallest basic solar electric device which generates electricity when exposed to light.

Drip line: The outermost edge of a roof including eaves, overhangs and gutters.

Ground-Mounted System: A solar photovoltaic system mounted on a structure, pole or series of poles constructed specifically to support the photovoltaic system and not attached to any other structure.

HVAC: Equipment used to heat, cool or ventilate a structure.

[Optional add-on] Impervious Surface: A surface area that prevents or retards the infiltration of water into the soil and/or a hard surface area that causes water to run off the surface of the ground in greater quantities or at an increased rate of flow from the conditions prior to development, construction, building or installation.

Interconnection: The technical and practical link between the solar generator and the grid providing electricity to the greater community.

Kilowatt (kW): A unit of electrical power equal to 1,000 Watts, which constitutes the basic unit of electrical demand. A watt is a metric measurement of power (not energy) and is the rate (not the duration) at which electricity is used. 1,000 kW is equal to 1 megawatt (MW).

Module: A module is the smallest protected assembly of interconnected PV cells.

Net Metering Agreement: An agreement with a local electric utility that allows customers to receive a credit for surplus electricity generated by certain renewable energy systems.

Photovoltaic (PV): A semiconductor based device that converts light directly into electricity.

Solar-based Architectural Element: Structural/architectural element that provides protection from weather that includes awnings, canopies, porches or sunshades and that is constructed with the primary covering consisting of solar PV modules, and may or may not include additional solar PV related equipment.

Solar Photovoltaic (PV) Related Equipment: Items including a solar photovoltaic cell, panel or array, lines, mounting brackets, framing and foundations used for or intended to be used for collection of solar energy.

Solar Photovoltaic (PV) System: A solar collection system consisting of one or more building- and/or ground-mounted systems, solar photovoltaic cells, panels or arrays

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and solar related equipment that rely upon solar radiation as an energy source for collection, inversion, storage and distribution of solar energy for electricity generation. A solar PV system is a generation system with a nameplate capacity of not greater than 50 kilowatts if installed at a residential service or not larger than 3,000 kilowatts at other customer service locations and do not produce excess on-site energy greater than currently permitted by Pennsylvania Public Utility Commission guidelines.

Tracking System: A number of photovoltaic modules mounted such that they track the movement of the sun across the sky to maximize energy production, either with a single-axis or dual-axis mechanism.

Unregulated Yard Area: Area not within a building and not in a defined setback or yard area.

Section 2. Purpose.

It is the purpose of this regulation to promote the safe, effective and efficient use of installed solar energy systems that reduce on-site consumption of utility-supplied energy while protecting the health, safety and welfare of adjacent and surrounding land uses and *[lots/parcels/properties]*. This Ordinance seeks to:

1. Provide *[lot/parcel/property]* owners and business owners/operators with flexibility in satisfying their on-site energy needs.
2. Reduce overall energy demands within the *[Municipality/Township/Borough/community]* and to promote energy efficiency.
3. Integrate alternative energy systems seamlessly into the *[Municipality/Township/Borough/community]*'s neighborhoods and landscapes without diminishing quality of life in the neighborhoods.

Section 3. Applicability.

1. This Ordinance applies to building-mounted and ground-mounted systems installed and constructed after the effective date of the Ordinance.
2. Solar PV systems constructed prior to the effective date of this Ordinance are not 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 PV system shall comply with the provisions of *[Section/Article]*.

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Section 4. Permitted Zoning Districts.

1. Building-mounted and ground-mounted systems are permitted in all zoning districts as an accessory use to any lawfully permitted principal use on the same [lot/parcel/property] upon issuance of the proper permit pursuant to [Section/Article] and upon compliance with all requirements of this section and as elsewhere specified in this Ordinance.
2. Building-integrated systems, as defined by this Ordinance, are not considered an accessory use and are not subject to the requirements of this Ordinance.

Section 5. Location Within a [Lot/Parcel/Property].

1. Building-mounted systems are permitted to face any rear, side and front yard or any unregulated yard area as defined in [Section/Article] of this Ordinance. Building-mounted systems may only be mounted on lawfully permitted principal or accessory structures.
2. Ground-mounted systems are permitted based on the requirements for accessory uses or structures in the property's zoning district.

Section 6. Design and Installation Standards.

1. The solar PV system must be constructed to comply with the Pennsylvania Uniform Construction Code (UCC), Act 45 of 1999, as amended, and any regulations adopted by the Pennsylvania Department of Labor and Industry as they relate to the UCC, except where an applicable industry standard has been approved by the Pennsylvania Department of Labor and Industry under its regulatory authority.
2. All wiring must comply with the National Electrical Code, most recent edition, as amended and adopted by the Commonwealth of Pennsylvania.
 - a. **[Optional add-on]** For ground-mounted systems, all exterior electrical lines must be buried below the surface of the ground where possible or be placed in conduit.
3. The solar PV system must be constructed to comply with the most recent fire code as amended and adopted by the Commonwealth of Pennsylvania.

Section 7. Setback Requirements.

1. Ground-mounted systems. Ground-mounted systems are subject to the accessory use or structure setback requirements in the zoning district in which the system is to be constructed. The required setbacks are measured from the [lot/parcel/property] line to the nearest part of the system. No part

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of the ground-mounted system shall extend into the required setbacks due to a tracking system or other adjustment of solar PV related equipment or parts.

Section 8. Height Restrictions.

1. Notwithstanding the height limitations of the zoning district:
 - a. For a building-mounted system installed on a sloped roof that faces the front yard of a [lot/parcel/property], the system must be installed at the same angle as the roof on which it is installed with a maximum distance, measured perpendicular to the roof, of eighteen (18) inches between the roof and highest edge or surface of the system.
 - b. For a building-mounted system installed on a sloped roof, the highest point of the system shall not exceed the highest point of the roof to which it is attached.
2. Notwithstanding the height limitations of the zoning district:
 - a. For a building-mounted system installed on a flat roof, the highest point of the system shall be permitted to extend up to six (6) feet above the roof to which it is attached.
3. Ground-mounted systems may not exceed the permitted height of accessory structures in the zoning district where the solar PV system is to be installed.

Section 9. Screening and Visibility.

1. Building-mounted systems on a sloped roof shall not be required to be screened.
2. **[Optional add-on]** Building-mounted systems mounted on a flat roof shall not be visible from the public right-of-way within a [# (number) foot] radius of the property, exclusive of an alley as defined by this Ordinance, at a level of 5 (five) feet from the ground in a similar manner as to any other rooftop HVAC or mechanical equipment. This can be accomplished with architectural screening such as a building parapet or by setting the system back from the roof edge in such a manner that the solar PV system is not visible from the public right-of-way within a [# (number) foot] radius when measured at a distance of 5 (five) feet from the ground.

Section 10. Impervious [Lot/Parcel/Property] Coverage Restrictions.

1. The surface area of any ground-mounted system, regardless of the mounted angle of any portion of the system, is considered impervious surface and shall be calculated as part of the [parcel/property] lot coverage limitations

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for the zoning district. If the ground-mounted system is mounted above existing impervious surface, it shall not be calculated as part of the [parcel/property] lot coverage limitations for the zoning district.

Section 11. Non-conformance.

1. Building-mounted systems:

- a. If a building-mounted system is to be installed on any building or structure that is non-conforming because its height violates the height restrictions of the zoning district in which it is located, the building-mounted system shall be permitted so long as the building-mounted system does not extend above the peak or highest point of the roof to which it is mounted and so long as it complies with the other provisions of this Ordinance.
- b. If a building-mounted system is to be installed on a building or structure on a non-conforming [lot/parcel/property] that does not meet the minimum setbacks required and/or exceeds the lot coverage limits for the zoning district in which it is located, a building-mounted system shall be permitted so long as there is no expansion of any setback or lot coverage non-conformity and so long as it complies with the other provisions of this Ordinance.

2. Ground-mounted systems:

If a ground-mounted system is to be installed on a [lot/parcel/property] containing a structure that is non-conforming because the required minimum setbacks are exceeded, the proposed system shall be permitted so long as the system does not encroach into the established setback for the [lot/parcel/property]. If a ground-mounted system is to be installed on a [lot/parcel/property] that is non-conforming because it violates zoning district requirements other than setbacks, then a variance must be obtained for the proposed installation.

Section 12. Signage and/or Graphic Content.

1. No signage or graphic content may be displayed on the solar PV system except the manufacturer's badge, safety information and equipment specification information. Said information shall be depicted within an area no more than thirty-six (36) square inches in size.

Section 13. Performance Requirements.

1. All solar PV systems are subject to compliance with applicable performance standards detailed elsewhere in the Zoning Ordinance

Western Pennsylvania Rooftop Solar Challenge

PennFuture

EPD, LLC

10/23/12

Section 14. Inspection, Safety and Removal.

1. The [Municipality/Township/Borough] reserves the right to inspect a solar PV system for building or fire code compliance and safety.
2. If upon inspection the [Municipality/Township/Borough] determines that a fire code or building code violation exists, or that the system otherwise poses a safety hazard to persons or property, the [Municipality/Township/Borough] may order the [owner/property owner/land owner/facility owner/operator] to repair or remove the system within a reasonable time. Such an order shall be in writing, shall offer the option to repair, shall specify the code violation or safety hazard found and shall notify the [owner/property owner/land owner/facility owner/operator] of his or her right to appeal such determination.
3. If a [owner/property owner/land owner/facility owner/operator] fails to repair or remove a solar PV system as ordered, and any appeal rights have been exhausted, the [Municipality/Township/Borough] may enter the [lot/parcel/property], remove the system and charge the [owner/property owner/land owner/facility owner/operator] for all costs and expenses of removal, including reasonable attorney's fees or pursue other legal action to have the system removed at the [owner/property owner/land owner/facility owner/operator]'s expense.
4. In addition to any other available remedies, any unpaid costs resulting from the [Municipality/Township/Borough]'s removal of a vacated abandoned or de-commissioned solar PV system shall constitute a lien upon the [lot/parcel/property] against which the costs were charged. Legal counsel of the [Municipality/Township/Borough] shall institute appropriate action for the recovery of such cost, plus attorney's fees, including, but not limited to filing of municipal claims pursuant to 53 P.S. § 7107, et seq., for the cost of such work, 6% interest per annum, plus a penalty of 5% of the amount due plus attorney's fees and costs incurred by the [Municipality/Township/Borough] in connection with the removal work and the filing of the [Municipality/Township/Borough]'s claim.

Section 15. Permit Requirements.

1. Before any construction or installation on any solar PV system shall commence, a permit issued by [Municipality name] shall be obtained to document compliance with this Ordinance.

SOLAR FRIENDLY ZONING TOOLBOX:

This Model Solar Ordinance is a component of the Solar Friendly Zoning Toolbox, a collection of tools and resources to help local officials develop comprehensive and well-balanced local ordinances and master plans that allow citizens the choice, now and in the future, to power their homes with clean solar energy.



3. Model Solar Zoning Ordinance

FOR RESIDENTIAL AND NON-RESIDENTIAL DISTRIBUTED SOLAR ENERGY SYSTEMS

1.0 Purpose

An ordinance to amend the zoning ordinance of [MUNICIPALITY NAME], by amending [ARTICLE/SECTION], *Definitions*, by adding definitions for solar energy systems and by amending [ARTICLE/SECTION], adding a new section to permit solar energy systems as an accessory use to permitted, conditional, and special exception uses in any zoning district.

This ordinance aims to promote the accommodation of distributed, on-site residential and non-residential solar energy systems installed to reduce on-site energy consumption and associated equipment, as well as adequate access to sunlight necessary for such systems. This ordinance does not address utility-scale solar energy systems, intended for the sale of electricity to utilities, industries, and/or businesses.

This ordinance permits, as an accessory use, solar energy systems, while protecting the 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 use, subject to specific criteria as set forth below. Where general standards and specific criteria overlap, specific criteria shall supersede general standards.

2.0 Definitions

- 2.1. **Accessory Use:** A use customarily incidental and subordinate to the primary use or building and located on the same lot therewith. A use which dominates the primary use or building in area, extent, or purpose shall not be considered an accessory use.
- 2.2. **Battery Back-Up:** A battery system that stores electrical energy from a solar PV system, making the electricity available for future use. Battery Back-Up systems are common in Off-Grid Systems and Hybrid Systems.



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- 2.3. Combiner or Junction Box:** Combines the inputs (electrical flows) from multiple strings of solar panels (or micro-inverters) into one output circuit.
- 2.4. Crystalline silicon cells:** Solar photovoltaic cells fashioned from either mono-crystalline, multi-crystalline, or ribbon silicon capable of converting sunlight into electricity. Crystalline silicon solar PV panels are the most commonly used and are generally the most efficient.
- 2.5. Distributed Solar:** For the purposes of this Ordinance, distributed solar refers to solar energy systems located on-site and designed to provide solar thermal energy or solar PV electricity to a property owner, occupant, and/or facilities.
- 2.6. Grid-tied Solar** - A solar PV system that is interconnected with the utility grid via net metering and interconnection agreements with the utility.
- 2.7. Electricity Generation (aka production, output)** - The amount of electric energy produced by transforming other forms of energy, commonly expressed in kilowatt-hours (kWh) or megawatt-hours (MWh).
- 2.8. Electrical 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.
- 2.9 Grid-tied Solar Photovoltaic Systems (aka grid-tied PV, on-grid, grid-connected, utility-interactive, grid-intertied, or grid-direct):** Solar photovoltaic electricity generation systems designed to serve the electricity needs of the building to which it is connected, thus offsetting a home's or business's electricity usage. Any excess electricity generated is sent to the electric utility grid, credited via a customer's net metering agreement with their local utility. Grid-tied are typically installed without battery back-up system to store electricity. As such, these systems provide no power during an outage. Typical system components: PV panels, inverter(s), and required electrical safety gear.
- 2.10. Ground-Mount System:** A solar energy system that is directly installed on specialized solar racking systems, which are attached to an anchor in the ground and wired to connect to an adjacent home or building. Ground-mount systems may be applicable when insufficient space, structural and shading issues, or other restrictions prohibit rooftop solar.
- 2.11. Hybrid Solar Photovoltaic Systems (aka grid-tied PV with battery back-up):** Solar photovoltaic electricity generation systems designed to serve the electricity needs of the building to which it is connected, thus offsetting a home's or business's electricity usage, while also utilizing a battery back-up in the event of a power outage. This is the only system that provides the ability to have power when the utility grid is down. Typical system components include: PV panels, inverter(s), and required electrical safety gear, battery bank, and a charge controller.



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- 2.12. International Residential Code (IRC)** - Part of the International Building Code (IBC), the IRC sets buildings standards for residential structures.
- 2.13. Inverter:** A device that converts the Direct Current (DC) electricity produced by a solar photovoltaic system is converted to useable alternating current (AC).
- 2.14. Kilowatt (kW)** - Equal to 1000 Watts; a measure of the use of electrical power.
- 2.15 Kilowatt-hour (kWh)** - A unit of energy equivalent to one kilowatt (1 kW) of power expended for 1 hour of time.
- 2.16. Mounting** - The manner in which a solar PV system is affixed to the roof or ground (i.e. roof mount, ground mount, pole mount).
- 2.17. Megawatt (MW)** - Equal to 1000 Kilowatts; a measure of the use of electrical power.
- 2.18. Megawatt-hour (MWh)** - A unit of energy equivalent to one Megawatt (1 MW) of power expended for 1 hour of time.
- 2.19. National Electric Code (NEC)** - Sets standards and best practices for wiring and electrical systems.
- 2.20. Net Meter:** On-grid solar PV systems connected to the utility grid use a net meter, typically provided and installed by the local utility, to measure the flow of electricity from the solar system for the purposes of net metering.
- 2.21. Net Metering:** A billing arrangement that allows customers with grid-connected solar electricity systems to receive credit for any excess electricity generated on-site and provided to the utility grid.
- 2.22. Off-Grid Solar Photovoltaic Systems with battery back-up:** Solar photovoltaic electricity systems designed to operate independently from the local utility grid and provide electricity to a home, building, boat, RV (or remote agricultural pumps, gates, traffic signs, etc.). These systems typically require a battery bank to store the solar electricity for use during nighttime or cloudy weather (and/or other back-up generation). Typical system components include: PV panels, battery bank, a charge controller, inverter(s), required disconnects, and associated electrical safety gear.
- 2.23. Orientation (or Azimuth):** In the northern hemisphere, true solar south is the optimal direction for maximizing the power output of solar PV. Although, systems can be oriented east,

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southeast, southwest, and west, while still providing 75%-85% of maximum production, depending on the tilt. Proper orientation and access to sun are critical for achieving maximum energy production potential (ideally, the orientation of the solar energy system ensures that solar access is not obstructed by other buildings, shade trees, chimneys, HVAC systems, or other equipment).

- 2.24. Passive Solar:** Techniques, design, and materials designed to take advantage of the sun's position throughout the year (and the local climate) to heat, cool, and light a building with the sun. *Passive solar* incorporates the following elements strategically to maximize the solar potential of any home or building (namely, maximizing solar heat gain in winter months and minimizing solar heat gain in summer months to reduce heating/cooling demand; and maximizing the use of daylighting to reduce demand for electricity for lighting): strategic design and architecture, building materials, east-west and building lot orientation, windows, landscaping, awnings, ventilation
- 2.25. Photovoltaic (PV) System:** A solar energy system that produces electricity by the use of semiconductor devices, called photovoltaic cells, which generate electricity when exposed to sunlight. A PV system may be roof-mounted, ground-mounted, or pole-mounted.
- 2.26. Pole-Mount Systems:** A solar energy system that is directly installed on specialized solar racking systems, which are attached to pole, which is anchored and firmly affixed to a concrete foundation in the ground, and wired underground to an attachment point at the building's meter. Unlike ground-mount systems, pole-mount systems are elevated from the ground. Pole-mounted systems can be designed to track the sun (with single-axis or dual-axis tracking motors) and maximize solar output throughout the year.
- 2.27 Power** - the rate at which work is performed (the rate of producing, transferring, or using energy). Power is measured in Watts (W), kilowatts (kW), Megawatts (MW), etc.
- 2.28. PV-Direct Systems:** The simplest of solar photovoltaic electric systems with the fewest components (no battery back-up and not interconnected with the utility) designed to only provide electricity when the sun is shining. Typical system components include: PV panels, required electrical safety gear, and wiring.¹
- 2.29 Racking:** Solar energy systems are attached securely and anchored to structural sections of the roof-mounted or pole-mounted systems. Specially designed metal plates called flashings prevent leaks and are placed under shingles and over bolts to create a water-tight seal.

¹ All content taken directly from Home Power – Solar Electricity Basics “What is Solar Electricity”. URL: <http://www.homepower.com/articles/solar-electricity/basics/what-solar-electricity>

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- 2.30 Roof-Mount System (aka rooftop mounted, building mounted):** A solar energy system consisting of solar panels are installed directly on the roof of a home, commercial building, and/or an accessory structure, such as a garage, pergola, and/or shed. Solar panels are mounted and secured using racking systems specifically designed to minimize the impact on the roof and prevent any leaks or structural damage. Roof-mount systems can be mounted flush with the roof or tilted toward the sun at an angle.
- 2.31. Solar Access:** the ability of one property to continue to receive sunlight across property lines without obstruction from another's property (buildings, foliage or other impediment). Solar access is calculated using a [sun path diagram](#).
- 2.32. Solar Array:** Multiple solar panels combined together to create one system.
- 2.33. Solar Collector:** A solar PV cell, panel, or array, or solar thermal collector device, that relies upon solar radiation as an energy source for the generation electricity or transfer of stored heat.
- 2.34. Solar Easement:** An easement recorded pursuant to U.C.A. §§ 57-13-1 and 57-13-2, the purpose of which is to secure the right to receive sunlight across the real property of another for the continued access to sunlight necessary to operate a solar energy system. According to Utah law, parties may voluntarily enter into written solar easement contracts that are enforceable by law. An easement must be created in writing and filed, duly recorded and indexed in the office of the recorder of the county in which the easement is granted. A solar easement, once created, runs with the land and does not terminate unless specified by conditions of the easement.
- 2.35. Solar Energy System:** A system capable of collecting and converting solar radiation into heat or mechanical or electrical energy and transferring these forms of energy by a separate apparatus to storage or to point of use, including, but not limited to, water heating, space heating or cooling, electric energy generation, or mechanical energy generation. This definition shall include Solar Thermal, Photovoltaic, and Passive Solar Systems.
- 2.36. Solar Glare:** The potential for solar panels to reflect sunlight, with an intensity sufficient to cause annoyance, discomfort, or loss in visual performance and visibility.
- 2.37. Solar Photovoltaic (Solar PV) System—** Solar systems consisting of photovoltaic cells, made with semiconducting materials, that produce electricity (in the form of direct current (DC)) when they are exposed to sunlight. A typical PV system consist of PV panels (or modules) that combine to form an array; other system components may include mountain racks and hardware, wiring for electrical connections, power conditioning equipment, such as an inverter and/or batteries. For the purposes of this Ordinance, a solar PV system is defined as generating capacity of not more than 25 kilowatts for residential facilities and not more than two



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megawatts for non-residential facilities. *[Solar PV systems larger than this are governed by another Ordinance]*

- 2.38. Solar Panel (or module):** A device for the direct conversion of sunlight into useable solar energy (including electricity or heat).
- 2.39. Solar Process Heat** technologies provide industrial specific applications, including ventilation air preheating, solar process heating, and solar cooling.
- 2.40 Solar-Ready:** The concept of planning and building with the purpose of enabling future use of solar energy generation systems. Solar-ready buildings, lots, and developments make it easier and more cost-effective to utilize passive solar techniques and adopt active solar technologies in the future. Solar-Ready Buildings are built anticipating future installation of active solar energy systems (including structural reinforcement, pre-wiring or plumbing for solar, and east-west building orientation). Solar-Ready Lots are oriented to take maximal advantage of a location's solar resource. Solar-Ready Developments expand this concept to entire subdivisions.
- 2.41. Solar Thermal System (aka Solar Hot Water or Solar Heating Systems):** A solar energy system that directly heats water or other liquid using sunlight. Consist of a series of tubes that concentrate light to heat either water or a heat-transfer fluid (such as food-grade propylene glycol, a non-toxic substance) in one of two types of collectors (flat-plate collectors and evacuated tube collectors). The heated liquid is used for such purposes as space heating and cooling, domestic hot water, and heating pool water.
- 2.42. Thin Film Solar PV** – Capable of generating electricity from the sun, thin film solar PVcells consist of layers of semiconductor materials (made from amorphous silicon, cadmium telluride, copper indium gallium diselenide, among other materials) a few micrometers thick, which allow for greater flexibility. Thin film is made by depositing one or more thin layers of photovoltaic material on a substrate; products include rooftop shingles and tiles, building facades, the glazing for skylights, and other building integrated materials.
- 2.43. Tilt:** The angle of the solar panels and/or solar collector relative to their latitude. The optimal tilt to maximize solar production is perpendicular, or 90 degrees, to the sun's rays at true solar noon. True solar noon is when the sun is at its highest during its daily east-west path across the sky (this is also known as 0° Azimuth). Solar energy systems can be manually or automatically adjusted throughout the year. Alternatively, fixed-tilt systems remain at a static tilt year-round
- 2.44. Watts (W)** - A measure of the use of electrical power (power (Watts) = voltage (volts) X current (Amps)).
- 2.45. Wiring:** Specified by electrical codes, solar PV system wires are routed from the panels or micro-inverters through conduit into the inverter and buildings meter.



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3.0 Applicability

- 3.1.** This ordinance applies to all distributed solar systems installed and constructed after the effective date of this Ordinance. For purposes of this Ordinance, "solar energy system" means a distributed solar energy system as defined herein.
- 3.2.** Solar energy systems constructed prior to the effective date of this ordinance shall not be required to meet the requirements of this ordinance.
- 3.3.** All solar energy systems shall be designed, erected, and installed in accordance with applicable local, state, utility, and national codes, regulations, and standards.

4.0 Solar Energy System Requirements

- 4.1.** To the extent practicable, and in accordance with [municipality] law, the accommodation of solar energy systems and associated electrical equipment, and the protection of access to sunlight for such, shall be encouraged in the application of the various review and approval provisions of the [municipality] code.
- 4.2.** Solar energy systems are permitted in all zoning districts as an accessory use to permitted, conditional, and special exception uses *[if building permits are not required for solar, insert appropriate provisions]*.
- 4.3.** 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.
- 4.4.** The installation and construction of a *roof-mount solar energy system* shall be subject to the following development and design standards:
 - A. A roof or building mounted solar energy system may be mounted on a principal or accessory building.
 - B. Any height limitations of the [municipality] Code shall not be applicable to solar collectors provided that such structures are erected only to such height as is reasonably necessary to accomplish the purpose for which they are intended to serve, and that such structures do not obstruct solar access to neighboring properties.
 - C. Placement of solar collectors on flat roofs shall be allowed by right provided that panels do not extend horizontally past the roofline.
- 4.5.** The installation and construction of a *ground-mount or pole-mount solar energy system* shall be subject to the following development and design standards:



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- A. The height of the solar collector and any mounts shall not exceed 20 feet when oriented at maximum tilt.
 - B. The surface area of a ground- or pole-mounted system, regardless of the mounted angle, shall be calculated as part of the overall lot coverage.
 - C. 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 apply less stringent setback requirements to solar energy systems].*
 - D. All power transmission lines from a ground mounted solar energy system to any building or other structure shall be located underground and/or in accordance with the building electrical code, as appropriate.
- 4.6.** All electrical equipment associated with and necessary for the operation of solar energy systems shall comply with the following:
- A. Electrical 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 apply less stringent setback requirements to solar energy systems].*
- 4.7.** Solar panels are designed to absorb (not reflect) sunlight; and, as such, solar panels are generally less reflective than other varnished or glass exterior housing pieces. However, solar panel placement should be prioritized to minimize or negate any solar glare onto nearby properties or roadways, without unduly impacting the functionality or efficiency of the solar system .
- 4.8.** A solar energy system shall not be used to display permanent or temporary advertising, including signage, streamers, pennants, spinners, reflectors, 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.
- 4.10.** A solar energy system shall not be constructed until a building/zoning permit has been approved and issued.



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5.0 Safety and Inspections

- 5.1.** The design of the solar energy system shall conform to applicable local, state and national solar codes and standards. A building permit reviewed by department staff shall be obtained for a solar energy system. All design and installation work shall comply with all applicable provisions in the National Electric Code (NEC), the International Residential Code (IRC), International Commercial Building Code, State Fire Code, and any additional requirements set forth by the local utility (for any grid-connected solar systems).
- 5.2.** The solar energy system shall comply with all applicable [municipality] Ordinances and Codes so as to ensure the structural integrity of such solar energy system. *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.*
- 5.3.** Prior to operation, electrical connections must be inspected by [an appropriate electrical inspection person or agency, as determined by the [municipality]].
- 5.5.** Any connection to the public utility grid must be approved by the appropriate public utility.
- 5.7.** If solar storage batteries are included as part of the solar collector system, they must installed according to all requirements set forth in the National Electric Code and State Fire Code when in operation. When no longer in operation, the batteries shall be disposed of in accordance with the laws and regulations of [municipality] and any other applicable laws and regulations relating to hazardous waste disposal.
- 5.9.** Unless otherwise specified through a contract or agreement, the property owner of record will be presumed to be the responsible party for owning and maintaining the solar energy system.

6.0 Abandonment and removal

- 6.1.** If a ground mounted solar energy system is removed, any earth disturbance as a result of the removal shall be landscaped in accordance with [local rules]
- 6.2.** A ground or pole-mounted solar energy system is considered to be abandoned or defective if it has not been in operation for a period of twelve (12) months. If abandoned, the solar energy system shall be repaired by the owner to meet federal, state, and local safety standards, or be removed by the owner within the time period designated by a [City] Building Code Official. If the owner fails to remove or repair the defective or abandoned solar energy system, the [City] may pursue a legal action to have the system removed at the owner's expense.

7.0 Appeals



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- 7.1. If the owner of a solar energy system is found to be in violation of the provisions of this Ordinance, appeals should be made in accordance with the established procedures of the [municipality] code.
- 7.2. If a building permit for a solar energy system is denied because of a conflict with other goals of the [municipality], the applicant may seek relief from the [municipality board of zoning appeals], which shall regard solar energy as a factor to be considered, weighed, and balanced along with other factors.

8.0 Solar-Ready Zoning

- 8.1. New structures will, to the extent possible and insofar as practical, be situated on the lot to take advantage of solar access, including the orientation of proposed buildings with respect to sun angles, the shading and windscreen potential of existing and proposed vegetation on and off the site, and the impact of solar access to adjacent uses and properties.
- 8.2. To permit maximum solar access to proposed lots and future buildings, wherever reasonably feasible and where consistent with other appropriate design considerations, new streets shall be located on an east-west axis to encourage building siting with the maximum exposure of roof and wall area to the sun.
- 8.3. [Municipal] tree-planting programs shall take into account the impact of street trees on the solar access of surrounding properties and, where possible, efforts shall be made to avoid shading possible locations of solar collectors.
- 8.4. When the [planning/zoning board] reviews and acts upon applications for subdivision approval or site plan approval, it shall take into consideration whether the proposed construction would block access to sunlight between the hours of [9:00 am and 3:00 pm] Mountain Standard Time for existing ground-mount, pole-mount, or roof-mount solar energy collectors or for solar energy collectors for which a permit has been issued.
- 8.5. Where reasonable and appropriate, new subdivisions should be platted so as to preserve or enhance solar access for either passive or active systems, consistent with the other requirements of the [municipality] code.
- 8.6. The plan for development of any site within cluster subdivisions shall be designed and arranged in such a way as to promote solar access for all dwelling units. Considerations may include the following:
 - A. In order to maximize solar access, the higher density dwelling units should be placed on a south-facing slope and lower-density dwelling units sited on a north-facing slope.



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- B. Subject to the [municipality's] setback requirements, structures should be sited as close to the north lot line as possible to increase yard space to the south for reduced shading of the south face of a structure.
 - C. A tall structure should be sited to the north of a short structure.
- 8.7. Solar-Ready zoning should be considered as one among multiple considerations in planning new developments.

9.0 Restrictions on Solar Prohibitions

In Accordance with Utah Code [Utah Code 57-13](#) and [Utah Code 10-9a-610](#), [Municipality] and the [Zoning Governing Authority] maintains and reserves the right to refuse any plat or subdivision plan if deed restrictions, covenants or other agreements running with the land prohibit or have the effect of prohibiting reasonably sited and designed solar collectors or other renewable resource devices.

10.0

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

11.0

This Ordinance shall take effect [XX days] after the date of its enactment.

DULY ORDAINED AND ENACTED the _____ day of _____, 20__, by the [*Governing Body*] of the Town/City of [*Municipality name*], in the County of [*County name*], in the State of Utah, in lawful session duly assembled.

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

ATTEST:



The **Wasatch Solar Challenge** is a diverse partnership of local governments and local non-profit organizations working collaboratively to create a widespread, "solar-friendly" environment that enables increased adoption of residential and commercial solar PV. Through workshops, trainings, and peer-to-peer exchange forums, partners collaborated to identify workable best practices for solar permitting, inspections, interconnection, zoning, and financing.