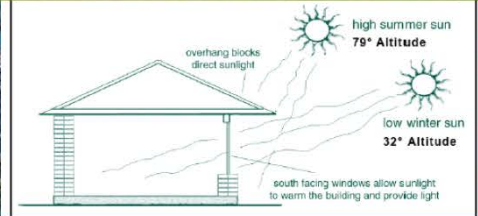
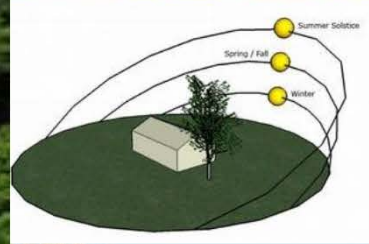


SUSTAINABLE LAND USE CODE PROJECT

Capitol Region Council of Governments



MODEL REGULATIONS: SOLAR ACCESS

November 2013



In Association with:
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SOLAR ACCESS

Introduction

Alternative energy sources such as wind, sun, geothermal, and biofuels are becoming more viable sources for power as technology advances. In the U.S., only about 12 percent of energy is generated from renewable sources, and only about 0.2 percent from solar.¹ Some experts believe these percentages will increase rapidly as solar energy system costs decrease and the price of fossil fuels rises—to the extent that the cost of solar energy may be on par nationally with the cost of energy from fossil fuels by 2015, and cheaper by 2025. Already solar is cost competitive with fossil fuels in New York, California, and Hawaii. The State of Connecticut has taken a number of steps to promote solar such as recently exempting commercial solar collection systems from personal property taxes.² Awareness and interest in these issues have also increased as funding and incentives for energy conservation and alternative energy projects have become more readily available to local governments, businesses, and homeowners. Most jurisdictions in the region do not address solar energy systems in their land use regulations, although some do process applications for solar energy systems using existing general accessory use standards. Others reportedly review applications informally on an ad hoc basis. Several recent national studies have established that the lack of clear local zoning standards for alternative energy systems creates uncertainty for installers and constitutes a major stumbling block to increased use of such systems. Moreover, variable and sometimes contradictory regulations among local governments in a region also have been documented as another significant hindrance. For these reasons, during Phase One of this project, the Clarion Associates consultant team drafted model zoning standards to promote solar energy systems.



Residential solar panels

While these new provisions are critical, to be effective they should be coupled with standards that help assure solar access for homeowners and businesses that install solar energy systems. Improperly sited buildings and vegetation on adjacent properties can render such systems ineffective. Historically, access to sunlight was a primary purpose of zoning codes in urban areas, sunlight being considered essential to public health. Today, an increasing number of communities such as Boulder, CO, and Ashland, OR, are adopting provisions in their development codes to protect solar access for property owners who have installed solar energy systems. Connecticut state zoning law (Conn. Gen. Stat. Ann. Sec. 8-2(a)) allows cities and towns to enact zoning regulations to encourage energy-efficient development patterns and use of solar energy. However, only a few localities in the Hartford region address solar access in their development codes. For example, Ellington and Manchester include solar access among those aspects required to be considered when laying out subdivision streets and lots.

To address this important issue of solar access, we have drafted land use regulations to help protect solar access without causing undue hardship for adjacent property owners. The basic provisions allow property owners who install solar collectors to obtain a special permit for those systems with the local government and thereby obtain a right to solar access that protects those systems from shading by new structures or vegetation on adjacent property. The step-up option provides a more detailed system of solar access protection similar to ones in use in Boulder, CO, and Santa Barbara, CA. The step-up option provides automatic protection for solar collectors without the owner having to seek a special permit from the local government. As these model regulations were being drafted, the Connecticut Clean Energy and Investment Authority, working as part of the U.S. Department of Energy's SunShot Initiative

¹ U.S. Energy Information Administration / *Monthly Energy Review June 2012*.

² Public Act 13-61.

Rooftop Solar Challenge, issued a final report entitled Sun Rise New England—Open for Business: Connecticut’s Rooftop Solar Challenge that contains numerous recommendations for promoting solar development, including ideas about protecting solar access through uniform and streamlined land use regulations and perhaps a state level solar access statute. We believe these model recommendations are consistent with the recommendations of that report and provide a set of alternative ways to implement that report’s overarching proposals.

DRAFT

1.1 SOLAR ACCESS—GENERAL

1.1.1. PURPOSES

The purposes of these provisions relating to solar access are to:

- A. Promote the use of solar collectors;
- B. Provide opportunities for homeowners and businesses to save fuel costs;
- C. Encourage orientation of structures on solar-oriented lots to take maximum advantage of solar access; and
- D. Ensure that site elements do not excessively shade potential solar collectors on adjacent properties.

1.1.2. DEFINITIONS

Note: Relevant definitions are set forth in each subsection that follows. These definitions should be included in the definition section of the local land use regulations.

- A. **Beneficial use** means the solar collector has received all necessary building and other permits required by the municipality and is operable.
- B. **Potentially affected property owner** means the applicant or the owner of the fee simple title or the contract purchaser of real property that lies within 300 feet of the solar collector.
- C. **Solar collector** means one of the following which is capable of collecting, storing, or transmitting at least 25,000 BTUs on a clear winter solstice day:

1. A small solar collection system: a roof-mounted panel, wall-mounted panel, or other solar energy device other than a solar array with a rated capacity of up to 10 kilowatts³, the primary purpose of which is to provide for the collection, inversion, storage, and distribution of solar energy for electricity generation, space heating, space cooling, or water heating on-site—provided, however, that any excess energy output may be delivered to a power grid to offset the cost of energy on-site.



Solar collection system

2. A solar array: a free-standing, ground-mounted system consisting of a linked series of photovoltaic modules, the primary purpose of which is to provide for the collection, inversion, storage, and distribution of solar energy for electricity generation, space heating, space cooling, or water heating on-site—provided, however, that excess energy output may be delivered to a power grid to offset

³ The average size of a grid-connected residential solar system is currently six kilowatts and has been on an upward trend for a decade. We have established the standard in this draft at 10 kilowatts to reflect what is commonly recognized as the dividing line between small residential systems and larger systems, as well as to account for estimated increases in size over the next few years. Each local government will need to adjust this measurement in the future as residential systems become more efficient.

the cost of energy on-site. A wall, clerestory window, or skylight designed to transmit solar energy into a structure for heating purposes;

3. A greenhouse attached to another structure and designed to provide part or all of the heating load for the structure to which it is attached;
 4. A trombe wall, drum wall, massive structural element, or other wall or roof structural element designed to collect solar energy and transmit it to internal spaces for heating; or
 5. Other devices or combination of devices that rely on sunshine as an energy source.
- D. **Solar right** means a right to an unobstructed line-of-sight path from a solar collector to the sun that permits radiation from the sun to fall directly on the solar collector. The extent of the solar right shall be defined by that illumination provided by the path of the sun on the winter solstice day that is put to a beneficial use or otherwise limited by local or state law.
- E. **Winter solstice day** means the solstice on or about December 21st that marks the beginning of winter in the northern hemisphere and is the time when the sun reaches its southernmost point.

1.1.3. **SOLAR ACCESS SPECIAL PERMIT**

- A. A solar access special permit shall be issued by the (Insert appropriate decision-making body) prior to the granting of a solar right.
- B. A solar access special permit shall be granted for any proposed or existing solar collector that complies with the requirements of this ordinance, other municipal ordinances, and state law, as relevant.

1.1.4. **PERMISSIBLE ZONE DISTRICTS**

Solar access special permits may be approved and solar rights granted only in the following zone districts: (ADD APPROPRIATE LOCAL ZONE DISTRICTS WHERE SOLAR RIGHTS WILL BE GRANTED.)⁴

1.1.5. **APPLICATION AND REVIEW PROCEDURE⁵**

- A. Applications for a solar access special permit shall be filed with the (Insert appropriate local official such as the planning director) and shall consist of at least the following materials:⁶
 1. An original and two copies of a completed application form (as provided by the municipality).
 2. The names and address of all potentially affected property owners.

⁴ Some localities do not grant solar rights in downtown, commercial, mixed-use, and multifamily areas where taller buildings (which might shade adjacent properties) are permitted and encouraged.

⁵ Some local governments may choose to adopt solar collection system standards that allow installation of such a system by right if all standards are met, without the need for issuance of a solar access special permit. In such cases, the local government may elect to require a solar access special permit only if the applicant desires to secure a solar right for the collection system.

⁶ This list is illustrative only. Each local jurisdiction should determine application requirements, including an application fee, as appropriate for that municipality.

3. A site plan drawn to scale depicting the following detail:
 - a. Title block containing the owner's name and the legal and common addresses of the site for which a solar access special permit application has been filed;
 - b. North arrow, scale, and date of preparation of the plan,;
 - c. Names of all adjacent streets;
 - d. Dimensions of the subject property;
 - e. Dimensions, heights, and location of all structures on the site and neighboring property as required by the (Insert name of appropriate local official);
 - f. Location, height, and type of trees, bushes, and shrubs on-site and on adjacent property, and their estimated height at full growth;
 - g. Location and heights of all walls and fences on the site and within five feet of the property line of adjacent property;
 - h. Location, height, dimensions, design, construction, and orientation of the solar collector;
 - i. Such topographical information and engineering calculations as may be necessary for the (Insert name of local official) to analyze the site plan and document the solar right; and
 - j. Signature block for municipal approval.
- B. On determining that an application for a solar access special permit is complete, the (Insert name of appropriate local official) shall accept the application for review and notify all potentially affected property owners (See definition.).
- C. The (Insert name of appropriate local official) shall review the application and site plan, inspect the proposed site if necessary, and make a recommendation to the (Insert name of local decision-making body) whether to grant, grant with conditions, or deny the application.
- D. The (Insert name of decision-making body) shall review the special permit and site plan in accord with Connecticut state law.
- E. After approval of the solar access special permit application, the (Insert name of appropriate local official) shall issue the applicant a solar access special permit that includes a description of the solar collector surface or that portion of the solar collector surface to which solar rights are granted. The description shall include the dimensions of the collector surface, the direction of the collector's orientation, the height of the collector above ground level, and the location of the collector on the solar user's property. The permit shall also include any conditions of approval of the solar access special permit application.
- F. After issuance of the solar access special permit and expiration of the appeal period, the applicant shall record the approved solar access special permit and associated site plan in the appropriate municipal land records. The recorded special permit shall contain a list of the Assessor's lots and addresses of all property owners that received notice of

the application and its granting. After recording the permit, the applicant shall provide a copy of the recorded solar access special permit and site plan to the (Insert name of appropriate local official).

1.1.6. LIMITATIONS ON SOLAR RIGHTS

- A. Solar collectors shall be located on the solar user's property so as not to unreasonably or unnecessarily restrict the uses of neighboring property. Unreasonable or unnecessary restrictions shall include, but are not limited to, any restriction that would prohibit the uses allowed by municipal code (but not including planting of trees).
- B. No solar right shall attach to a solar collector or a portion of a solar collector that would be shaded on a winter solstice day by a hypothetical nonlight-transmitting, ten-foot-high wall located on the property line.
- C. The solar right to radiation that would strike a solar collector before 9:00 a.m. or after 4:00p.m. Eastern Time is deemed *de minimus* and may be infringed upon without violating solar rights granted pursuant to this ordinance.
- D. Blockage of less than 20 percent of the solar energy that would strike a solar collector at any point during any given day between 9:00 a.m. and 3:00 p.m. Eastern Time shall be deemed *de minimus* and may be infringed upon without violating solar rights granted pursuant to this ordinance.
- E. The priority of new construction with regard to interference in solar rights shall vest as of the date of application for a building permit.

1.1.7. LAPSE AND BENEFICIAL USE RESTRICTIONS

- A. Solar rights under applications filed subsequent to the effective date of the ordinance shall vest on the date the solar access special permit is issued or if an appeal is filed, the date of final action by the [Insert name of local appellate authority]. Such date shall also be the priority date of the solar right. The solar collector shall be put to beneficial use within two years of that vesting date, or within such additional time time as may be granted by the (Insert name of appropriate local official) for good cause shown. If the solar collector is not put to beneficial use within this time period, the solar access permit shall become null and void and the (Insert name of appropriate local official) shall revoke the permit and record the revocation with the county clerk.
- B. Upon installation of the solar collector by the applicant, the (Insert name of local official) shall certify the beneficial use of the solar collector and record a certificate of beneficial use with the county clerk.
- C. Users of solar collectors that existed prior to the effective date of this ordinance shall apply for a solar access special permit(s) within five years after the effective date. Failure to apply for and receive such permit(s) shall foreclose issuance of a solar access special permit for such solar collectors after that time. Where a solar access special permit is approved and issued for a solar collector that existed before the effective date of this ordinance, the priority date for solar rights for such solar collector shall be the first date the solar collector was beneficially used, which shall be determined by the (Insert name of appropriate local official).

1.1.8. PRIOR EXISTING USES

- A. The lawful location of structures in existence prior to the time of beneficial use of an existing solar collector or in existence on the effective date of this ordinance may be continued, even though the location or impact does not conform to the requirements of this section, provided the structure conforms or is legally nonconforming in other aspects of the municipal zoning code.
- B. The applicant for a solar access special permit shall be required to take the permit subject to the natural growth of all vegetation that exists at the time of filing the application.
- C. Pre-existing lawful structures that have been damaged by fire or a calamity may be restored to their original condition as provided for non-conforming uses in (Add appropriate section of nonconforming uses in municipal zoning code). Pre-existing vegetation that has been damaged by fire or a calamity may be replanted, provided the replanting is commenced within 18 months of the calamity. In addition, normal and routine maintenance of pre-existing structures or vegetation may be carried out.
- D. Whenever the use of an existing structure has been discontinued for a period (Add cross reference to non-conforming use section of municipal zoning code) or vegetation has been removed and not replanted within 18 months, the structure or vegetation shall not thereafter be re-established except in conformance with provisions of (Add reference to non-conforming use section of municipal zoning code) this ordinance.

Scale-Up Option

The solar access provisions set forth above are basic and require affirmative steps by the owner of the solar collector to secure solar access rights. Some communities such as Boulder, CO, Ashland, OR, and Santa Barbara, CA, have established automatic zoning provisions to protect solar access. For example, Boulder has a detailed system that creates a protective solar envelope for most single-family dwelling units and requires an analysis of any development that may impinge on that solar additional envelope.⁷ This scale-up option reflects the approach in these communities that provide enhanced protection of solar collectors without having to seek a solar access special permit. **It would be adopted instead of the basic provisions above.**

1.1.1. PURPOSES

The purposes of these provisions relating to solar access are to:

- A. Promote the use of solar collectors;
- B. Provide opportunities for homeowners and businesses to save fuel costs;

⁷ For a detailed discussion of solar access laws in the United States with suggested model ordinance standards, see Kettles, [A Comprehensive Review of Solar Access Laws in the United States \(2008\)](#). <http://www.solarabcs.org/about/publications/reports/solar-access/pdfs/Solaraccess-full.pdf>. See also the California Solar Shade Control Act, Cal. Pub. Res. Code 25980-25986, which offers protection for solar collection systems from shading by trees and other structures.

- C. Encourage orientation of single-family dwellings on solar-oriented lots to take maximum advantage of solar access; and
- D. Ensure that site elements do not excessively shade potential solar system locations on adjacent property.

1.1.2. DEFINITIONS

Note: Select relevant definitions from basic option above.

1.1.3. APPLICABILITY

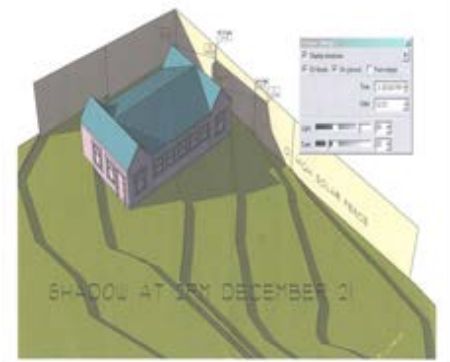
- A. **Private Property:** All private property is subject to this section.
- B. **Development Approval:** No proposed development permit may be approved for any structure that would violate the basic solar access provided by this section unless the object or structure is exempt from this section in accordance with ____ or an exception is granted by the (Insert name of decision-making official or body) in accordance with Section 1.1.7.
- C. **Government Property:** Governmental organizations not under the jurisdiction of the (Insert name of adopting municipality) may elect to enjoy the benefits of solar access under this section if they also consent in a written agreement with the City to be bound by the requirements of this section.
- D. **City Property:** Property owned or possessed by the municipality is subject to this section, and enjoys the benefits of solar access under this section. The municipality may submit applications, make objections, and take actions that are afforded to any other person or entities subject to the provisions of this section.

1.1.4. SOLAR ACCESS AREAS ESTABLISHED

- A. The following solar access areas are hereby established: (Insert names of solar access areas or applicable zoning districts where solar protection is offered.)
- B. The purpose of dividing the municipality into solar access areas is to provide maximum solar access protection for each area of the municipality consistent with planned densities, topography, and lot configurations and orientations.⁸

1.1.5. SOLAR ACCESS PROTECTION

- A. **Solar Fence:** A hypothetical solar fence is overlaid on each lot located in the designated solar access areas or zone districts. Each solar fence completely encloses the lot in question, and its foundation is contiguous with the lot lines. Such fence is opaque and lacks any thickness.



⁸ Boulder, CO, has established three distinct solar access protection areas. The first is designed to protect solar access for south yards, south walls, and rooftops. The second is more limited and protects principally rooftops because of existing lot configuration or orientation, topography, and planned density. The third is for all other areas where because of unique topography or lot layout protection is afforded only on a case-by-case special permit request basis.

- B. No person shall erect an object or structure on any other lot that would shade a protected lot to a greater degree than the lot would be shaded by a solar fence 12 feet in height, between two hours before and two hours after local solar noon on a clear winter solstice day.⁹
- C. **Insubstantial Breaches and Existing Structures:** Insubstantial breaches of the basic solar access protection are exempt from the application of this section. A structure or vegetation in existence on the date of establishment of an applicable solar access area, or structures and vegetation in existence on the date of issuance of an applicable solar access special permit, are exempt from the application of this section. For purposes of this section, structures are deemed to be in existence on the date of issuance of a development permit authorizing its construction.
- D. **Temporary Solar Obstructions:** Unavoidable temporary obstructions of protected solar access necessitated by construction activities or other necessary and lawful purposes are exempt to the extent that they exist no more than ten days in any three-month period and 30 days in any year.
- E. **Solar Analysis:** When a solar analysis is required for any review process, it shall be prepared in compliance with the methods described in materials provided by the (Insert name of appropriate local official).

1.1.6. **AMENDMENT OF SOLAR ACCESS AREA BOUNDARIES:**

- A. The (Insert name of appropriate decision-making body) may amend the boundaries of established solar access areas on its own motion or on petition of any person with a property interest in the solar access area. A petitioner shall submit a list to the (Insert name of decision-making body) of the names and addresses of all potentially affected property owners.
- B. **Public Hearing and Notice Required:** Before amending the boundary of a solar access area, the (Insert name of decision-making body) shall conduct a public hearing on the proposal. The [Insert name of appropriate local official] shall provide notice for the hearing pursuant to the requirements of (Insert cross-reference to appropriate notice sections of zoning ordinance.).
- C. **Review Criteria:** A solar access area boundary may be amended only after the (Insert name of decision-making body) determines that one or more of the following conditions is satisfied:
 - 1. The subject area was established as a solar access area in error, and as currently established is inconsistent with the purposes of the solar access area.
 - 2. Permissible land uses and densities in the subject area are changing or should change to such a degree that it is in the public interest to amend the solar access area for the area.
 - 3. Experience with application of this ordinance has demonstrated that the level of solar access protection available in the subject area can be increased without significant interference with surrounding property or application of the ordinance

⁹ For more densely developed or planned mixed use and industrial areas, Boulder increases the hypothetical solar fence to 25 feet, which in effect allows higher development on adjacent sites closer to the property line.

has unreasonable interference with use and enjoyment of real property in the subject area.

- D. **Impact of Changes:** When any area is amended, any solar access beneficiary whose solar access is affected by such change may apply for a solar access special permit to provide solar access protection to any solar collector installed and in use on the date the change becomes effective.

1.1.7. EXCEPTIONS

- A. Any person or entity desiring to erect an object or structure, or increase or add to any object or structure, in such a manner as to interfere with the basic solar access protection, may apply for an exception.
- B. **Public Application Requirements:** An applicant for an exception shall pay an application fee prescribed by the municipality, and apply on a form furnished by the (Insert appropriate local department) that includes, without limitation:
1. The applicant's name and address, the property owner's name and address, and a legal description of the lot for which an exception is sought;
 2. Survey plats or other accurate drawings showing lot lines, structures, solar systems, dimensions, and topography as necessary to establish the reduction of basic solar access protection expected on each lot that would be affected by the exception, together with a graphic representation of the shadows that would be cast by the proposed structure during the period from 9:00 a.m. to 4:00 p.m. Eastern Time on a clear winter solstice day. The requirements of this subparagraph may be modified by the municipality, depending upon the nature of the exception sought.
 3. A list of all lots that may be affected by the exception, including the names and addresses of all owners of such lots.
 4. A statement and supporting information describing the reasons that less intrusive alternatives, if any, to the action that would be allowed by the exception cannot or should not be implemented or a statement certifying that the proposed structure would not obstruct solar access protected by permit.
- C. **Notice:** The (Insert name of appropriate local official.) shall provide notice pursuant to section _____ of the zoning ordinance. The (Insert name of decision-making official or body.) may grant an exception to this section following the public notification period if:
1. The applicant presents the (Insert name of decision-making official or body) with an affidavit by each potentially affected property owner declaring that such owner is familiar with the application and the effect the exception would have on the owner's lot, and that the owner has no objection to the granting of the exception;
 2. The (Insert name of decision-making official or body.) determines that the application complies with the requirements in paragraph B.2 of this section; and
 3. The (Insert name of decision-making official or body) finds that each of the requirements of paragraph 1.1.16.F of this section has been met.

- D. **Appeal of Decision By (Insert name of local official or body):** The decision may be appealed to the (Insert name of appeals body such as a city council or board of zoning adjustment) pursuant to the appeals provisions of Section ____ of the zoning ordinance.
- E. **Review Criteria:** In order to grant an exception, the approving authority must find that because of basic solar access protection requirements and the land use regulations:
1. Reasonable use cannot otherwise be made of the lot for which the exception is requested;
 2. The part of the adjoining lot or lots that the proposed structure would shade is inherently unsuitable as a site for a solar energy collector, or any shading would not significantly reduce the solar potential of the protected lot;
 3. Such situations have not been created by the applicant;
 4. The exception would be the minimal action that would afford relief in an economically feasible manner;
 5. The exception would cause the least interference possible with basic solar access protection for other lots;
 6. If the proposed structure is located in a historic district designated by the city council according to [insert appropriate reference to historic district designation procedures] and conformed with the requirements of this section, its roof design would be incompatible with the character of the development in the historic district;
 7. If part of a roof is proposed to be reconstructed or expanded and conformed with the requirements of this section, the reconstructed or expanded roof would be incompatible with the design of the remaining parts of the existing roof so as to detract materially from the character of the structure;
 8. If the proposed interference with basic solar access protection would be due to a solar collector being installed, such system could not be feasibly located elsewhere on the applicant's lot;
 9. If an existing solar system would be shaded as a result of the exception, the beneficiary of that system would nevertheless still be able to make reasonable use of it for its intended purpose;
 10. The exception would not cause more than an insubstantial breach of solar access protected by permit as defined in Section 1.1.14.C of this ordinance; and
 11. All other requirements for the issuance of an exception have been met.
- F. The applicant bears the burden of proof with respect to all issues of fact.
- G. **Conditions of Approval:** The [Insert name of approving authority] may grant exceptions subject to such terms and conditions as the [Insert name of approving authority] finds just and equitable to assist persons whose protected solar access is diminished by the exception. Such terms and conditions may include a requirement that the applicant for an exception take actions to remove obstructions or otherwise increase solar access for any person whose protected solar access is adversely affected by granting the exception.