

Solar Energy in Development Regulations: *Opportunities for New Development & Existing Structures*

A Discussion Paper for Energy Aware Communities

August 2014

Brief: Local governments have the opportunity to address solar energy in their community's comprehensive plans and development regulations. With support and clear language in development regulations, every community can utilize solar energy as a clean, local, and renewable resource while applying standards consistently and minimizing any conflicts.

Problem

With the rising threat of climate change and energy insecurity, it is becoming increasingly important to reduce the consumption of fossil fuels for energy production. Communities have the ability to meet their expanding energy needs with clean, renewable resources, such as solar energy. The efficiency of solar energy technology is increasing while the cost of solar energy systems is decreasing. Thus, solar energy systems are gaining popularity. Yet, unless solar energy is specifically addressed in local development regulations, a community's potential to take full advantage of the sun's energy may be restricted or unrealized.

Development regulations are often silent on solar energy systems, or may lack clear definitions, use permissions, and

development and dimensional standards related to solar energy.



Photo source: Carly Gilliland, Washington State Dept. of Commerce Intern

Introduction

The Pacific Northwest is a great location for solar energy production, especially with [net metering](#)¹ options and financial incentives. Communities can adopt solar development regulations to support solar energy use, remove potential barriers to solar energy use, and to minimize potential impacts of solar energy systems. Development regulations should clarify which types of solar development are allowed and where. Through development regulations, local governments can address solar ready construction, solar orientation of new

¹ <http://www.dsireusa.org/solar/solarpolicyguide/?id=17>

lots, and other factors that influence use of solar energy.



Photo source:
<http://www.mtu.edu/news/images/2012/image71886-horiz.jpg>

Definitions

Codes related to solar energy in development regulations should include a list of defined solar terms. When solar terms are defined, the need for later interpretation in the administration of the code is minimized. Solar terms should be consistent among local communities in order to reduce confusion and to simplify the regulation process, when possible. When referring to the protection of solar access, some communities use the term “solar envelope”, while others use “solar fence”. Planners can crosscheck lists of terms with adjacent communities.

Sample solar energy system terms and definitions:

- **Solar Access.** Seattle defines solar access as the amount of unrestricted sunlight that reaches a structure, or portion thereof.
- **Solar Collector.** Seattle defines solar collector as any device used to collect direct sunlight for use in the heating or cooling of a structure, domestic hot

water, or swimming pool, or the generation of electricity.

- active and passive solar energy systems
- primary and accessory solar uses
- building vs ground-mounted systems
- solar ready construction – Structures built with certain measures in place (recommend identifying what those are for each jurisdiction, see [Solar Ready Construction](#) paper) that allow for quicker and easier installation of a solar photovoltaic (PV) or a solar hot water system at a later date.

Zoning Code

Development regulations should establish clear requirements about where solar energy systems are allowed and the types of standards they must meet.

Dimensional Standards

Certain dimensional standards such as lot coverage limitations, maximum height, and minimum setbacks from property lines may limit solar energy development. Height or placement restrictions in codes can constrain the size, extent, and placement of solar energy systems, thus limiting their ability to produce energy. Communities can choose to allow limited exceptions to these standards for solar energy systems. If solar energy systems are not considered separately from the rest of the building, a developer may have to shrink their building to accommodate a system within existing standards. Alternatively, if these issues are not addressed, it can cause challenges for homeowners trying to work with existing structures that may

have been built to the maximum height allowances.

The City of Edmonds specifically addresses the installation of solar energy systems on roofs of buildings that exceed the height limit².

Edmonds Municipal Code

17.40.020 Nonconforming building and/or structure.

D. Maintenance and Alterations.

2. Solar Energy Installations on Buildings That Exceed Existing Height Limits. A rooftop solar energy installation mounted on a nonconforming building that exceeds the existing height limit may be approved as a Type II staff decision if:

- a. The installation exceeds the existing roof height by not more than 36 inches.
- b. The installation is designed and located in such a way as to provide reasonable solar access while limiting visual impacts on surrounding properties.

Seattle Solar Height Exception, SMC Section 23.45.545:

3. Solar collectors on roofs. Solar collectors that meet minimum written energy conservation standards administered by the Director and that are located on a roof are permitted as follows:

- a. In LR zones up to 4 feet above the maximum height limit or 4 feet

²

<http://www.codepublishing.com/wa/edmonds/?Edmonds21/Edmonds2140.html&?f>

above the height of elevator penthouse(s), whichever is higher; and

- b. In MR and HR zones up to 10 feet above the maximum height limit or 10 feet above the height of elevator penthouse(s), whichever is higher.
- c. If the solar collectors would cause an existing structure to become nonconforming, or increase an existing nonconformity, the Director may permit the solar collectors as a special exception pursuant to Chapter 23.76. Such solar collectors may be permitted even if the structure exceeds the height limits established in this subsection 23.45.545.C.3, when the following conditions are met:
 - 1) There is no feasible alternative solution to placing the collector(s) on the roof; and
 - 2) Such collector(s) are located so as to minimize view blockage from surrounding properties and the shading of property to the north, while still providing adequate solar access for the solar collectors.

Other communities allow height exceptions for solar systems or clarify that they are allowed in setback areas. Communities should determine the most appropriate dimensional standards and level of flexibility for different types of solar energy systems in each zoning district within their community.

Development Standards

Planners can propose development standards related to solar energy. These standards can minimize any potential

impacts of solar energy systems on neighboring uses and address any safety concerns.

Solar access can be maximized and protected with suitable development standards. Often standards do not exist to protect solar access, potentially compromising existing and future solar energy systems due to shading from trees and buildings. Codes can include parameters to guide the resolution of conflicts that may arise between competing interests.

Examples of Solar Access Codes:

- Ashland (Oregon), City of. 2011. *Municipal Code*. Title 18, Land Use; Section 18.70, Solar Access
- Clackamas (Oregon), County of. 2011. *Zoning and Development Ordinance*. Section 1017. Solar Access Ordinance for New Development.

When deciding how or if to address topics like solar access in development regulations, communities should strive to balance other goals and objectives. For example, balancing historic preservation or urban forestry issues with increasing solar energy PV systems. For more information on those issues, please see the [Solar in Comprehensive Plans](#) paper.

Rooftops of existing structures provide potential space for solar development that does not require consumption of new land. Planners can address specific issues to encourage greater solar energy development on existing structures. For example, codes can clarify that solar

panels on rooftops are allowed to be visible from streets or publicly owned lands, as long as the panels do not exceed a certain height or extend beyond the ridgeline of the roof. Provisions like these can encourage consistency across numerous Home Owners Associations (HOAs), which often have different approaches to how they address aesthetic issues (see [Addressing Rooftop Solar for HOAs](#) paper).



Photo source:

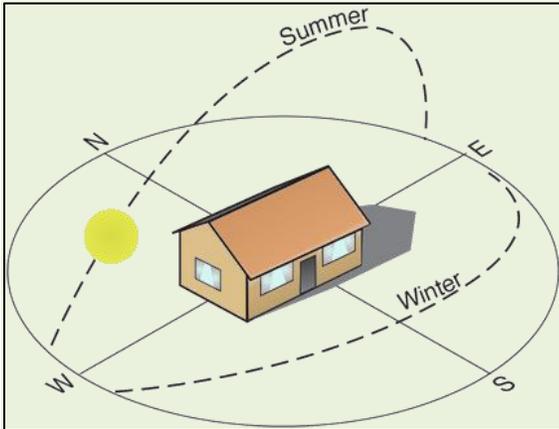
<http://science.howstuffworks.com/environmental/energy/solar-cell5.htm>

Subdivision Code

Solar site design requirements can be added to subdivision codes to ensure that new development is optimally sited for solar energy use. Solar access can be protected by subdivision codes that require developers to orient at least some of the lots so that future buildings will have unobstructed southern exposure to the sun for a designated amount of time each day.

Structure height and placement on the lot can be regulated to ensure solar access to the lot and neighboring lots. Roof angle and unobstructed roof space

(typically south and west facing roof planes) are also important. Development regulations can protect solar access for existing structures by including a process for obtaining solar access permits or recording solar easements.



Solar orientation

Source:

http://www.ecowho.com/articles/6/The_importance_of_building_orientation.html

For example, the City of Boulder, Colorado requires new residential development to have roof and exterior wall surfaces that are oriented toward the sun, have unimpeded solar access, and are structurally capable of supporting solar collectors³.

Laramie, Wyoming requires 40% of lots less than 15,000 square feet in single- and two-family residential developments to meet its “solar-oriented lot” definition. Development plans must also protect solar access to the maximum amount possible⁴.

Building Code

Planners may choose to include solar ready provisions in their local building codes. These provisions can require new construction to be electrically wired and plumbed to accommodate the later installation of solar PV or hot water systems. Building codes can also require roofs of new construction to be designed, oriented, and built to support the additional weight of solar energy systems. Local governments should hold solar ready documentation in the permit history of buildings, so future permitting can be streamlined.

Chula Vista, California includes PV pre-wiring requirements in its electrical code and solar water heater pre-plumbing requirements to its plumbing codes. These requirements apply to new residential development (Code sections 15.24.065 and 15.28.015)⁵.

For more information on solar ready construction, please see the discussion paper [Solar Ready Construction](#)⁶.

Energy Code

Another relevant topic area is the energy code. Opportunities include:

- Increasing energy efficiency requirements but allowing on-site energy production to count
- Creating an easy process for recognizing approving new products

³ APA [Planning for Solar Energy, page 59](#)

⁴ APA [Planning for Solar Energy, page 61](#)

⁵ APA [Planning for Solar Energy, page 62](#)

⁶ <http://www.commerce.wa.gov/Documents/Solar-Ready-Construction.pdf>

- Clarifying connection requirements
- Permit expediting

Installed on One- or Two-Family Dwellings. Also, Program Guide: Solar Water Heating and Photovoltaic Electric Generators Installed on Commercial Buildings.

Permitting Resources

Permitting⁷ is also relevant at the local government level and can be streamlined to incent rooftop solar PV. As part of the NW Solar Communities work, Permitting Best Practices were developed and then tailored to both Washington and Oregon states. The primary best practices include:

1. Adopt a Permit Checklist for Solar Installations
2. Establish Reasonable Building Permit Fees
3. Provide Solar Permit Information Online
4. Train Permit Staff in Solar Installations
5. Implement Online or E-permitting System

Additional Examples

- Henderson (Nevada), City of. 2011. *Development Code*. Chapter 19.7, Development and Design Standards; Section 19.7.12, Sustainability; Table 19.7.12-1, Menu of Site and Building Design Options for Sustainability, part 1.9: Solar-Ready Design.
- Portland (Oregon), City of, Bureau of Development Services. 2010. *Program Guide: Solar Water Heating and Photovoltaic Electric Generators*

⁷ See <http://nwsolarcommunities.org/priorities/permitting/>

Additional Resources

[APA Integrating Solar Energy into Local Development Regulations](#), Solar Briefing Paper Number 4

APA [Planning for Solar Energy](#), Report Number 575

Appendix A: Solar-Friendly Planning System Audit for Local Governments

Appendix D: Model Solar Development Regulation Framework

Leadership in Energy & Environmental Design, <http://www.usgbc.org/leed>

Planning and Zoning: An Opportunity for Local Governments to Support Rooftop Solar [report](#), March 2013

Municipal Research Services Center webpage on:

- Solar Energy Facilities - <http://www.mrsc.org/subjects/planning/energy/E-solar.aspx>
- Planning for Alternative Energy Facilities - <http://www.mrsc.org/subjects/planning/energy/e-plan.aspx>

Washington State Department of Commerce, Growth Management Services Unit, [Energy Aware Communities](#) webpage