

# Solar Energy in Comprehensive Plans

*A Discussion Paper for Energy Aware Communities*

*September 2014*

**Brief:** Each community has the potential to utilize solar energy as a local, renewable resource. By incorporating solar energy into comprehensive plans, communities can provide a policy basis for renewable energy systems and begin to take full advantage of the economic and environmental benefits of local solar energy production.

## Problem

Energy demand will continue to increase as population and economic activity expand. Fossil fuels are a finite resource. The combustion of fossil fuels for energy production emits harmful greenhouse gases and pollution. Many states, like Washington and Oregon, are working to reduce dependence on fossil fuels. Even in our region, where the majority of electricity is generated by hydropower, the decisions made today regarding how energy is produced and conserved will affect the local economy and global climate for years to come. Community priorities related to energy efficiency and renewable energy production should be clearly established in the local comprehensive plan.

Many local governments do not address solar energy in their plans. This may create a barrier or uncertainty to the public or to private developers that might use solar energy in our communities. Comprehensive plans should acknowledge solar energy and other

renewables as a resource, given that sunlight can be harvested to generate heat and electricity. A solid foundation for solar energy policy should be defined in the comprehensive plan in order to provide support for related development regulations. Communities should adopt plan policies that identify and encourage solar energy opportunities for residents and developers. Such policies may also support other efforts underway, such as sustainability plans or carbon pollution reduction efforts. Promoting renewable energy use can help enable the jurisdiction to meet any sustainability goals, greenhouse gas emission reduction limits, or increased energy efficiency goals for city building or community-wide.



Photo source:

<http://ecotechenergy.com/docs/Ecotech%20Trifold%20low-res%202-10-14.pdf>

## Introduction

Planners and policy makers have the ability to shape the future of their communities. An important topic<sup>1</sup> to

<sup>1</sup> In Washington, the Growth Management Act allows for solar energy and conservation as an optional element.

consider addressing is energy security and sustainability. By replacing fossil fuel use with clean, renewable energy sources, communities can reduce their greenhouse gas emissions and increase energy independence. Solar energy is a clean, abundant, and renewable local resource. Local benefits can be maximized with local installers and locally or regionally manufactured solar products.

The benefits of passive and active solar energy are numerous. By utilizing solar energy, communities may be able to lower their energy bills in the long run, reduce dependence on fossil fuels, provide jobs in solar system installation, manufacturing, research and design, and create a more sustainable and healthy future.



Photo source:  
<http://www.mnn.com/sites/default/files/editorial/solarPanellnstallation.jpg>

For communities to successfully “go solar” solar energy should be specifically supported in comprehensive plans and development regulations. Types of issues that could be addressed in comprehensive plans to support greater use of renewable energy systems include:

- Support for renewable energy systems on residential, commercial, industrial, and mixed-use structures
- Support for distributed energy generation
- Coordination with electricity providers to encourage small-scale renewable energy systems
- Support to conduct a process to identify potential barriers to renewables in existing codes or practices, along with suggestions to implement any corrections to reduce or eliminate conflicts
- Policies that address solar access or solar easements
- Policies to lead by example, such as by promoting solar energy systems on public buildings

## Comprehensive Planning

Planners have the opportunity to help their communities embrace solar energy through land-use planning. There may be certain areas within the community that can be addressed in the plan to promote solar energy systems.

For example, capped landfills and contaminated or vacant properties have the potential to be re-developed for the purpose of producing renewable energy. A local government may choose to support existing programs, such as EPA’s initiative [Re-powering America’s Land: Siting Renewable Energy on Potentially Contaminated Lands, Landfills, and Mine Sites](#),<sup>2</sup> which provides excellent information on the

<sup>2</sup> <http://www.epa.gov/renewableenergyland/>

topic. Also see the APA solar briefing paper "[Recycling Land for Solar Energy Development](#)."<sup>3</sup>

Policies to consider solar orientation of lots, streets, and buildings can be addressed in the comprehensive plan, in order to more efficiently use the land for capturing solar energy. Subdivisions can be designed to maximize solar access by orienting streets and front lot lines along an east-west axis. Building orientation is important for solar energy generation as well. In the northern hemisphere, a solar system will be the most efficient if oriented towards the south, followed by the west. Other opportunities to maximize solar energy system use include building placement on the lot, orientation of the roof, size of roof areas on the south or west facing side of the building, roof areas being kept free of shading or mechanical equipment, and more.

Local governments may choose to include an energy element in the comprehensive plan or add policies that support renewable energy electricity production and uses throughout existing chapters in their plans. Either way, policies may be added that encourage and incentivize increased energy efficiency and promote renewable energy. Below are example goals and policies:

Jackson County, Oregon, includes an [energy conservation chapter](#)<sup>4</sup> in its

<sup>3</sup><https://www.planning.org/research/solar/briefingpapers/recyclingland.htm>

<sup>4</sup> <https://www.co.jackson.or.us/Files/11%20-%20ENERGY.pdf>

comprehensive plan. It discusses several sources of electricity, energy use trends, and provides findings, policies, and implementation strategies. An excerpt of those policies include:

### **Jackson County, Oregon.**

Comprehensive plan, Chapter 11, Energy (2007)

**Policy:** Energy conservation measures shall be utilized in new development projects to achieve energy efficient development through combinations of site planning, landscaping, building design and construction practices.

**Policy:** The County should be more energy self-sufficient and shall actively encourage the development and use of local renewable energy resources and alternative energy systems on the community, neighborhood, and individual homesite level.

### **City of Olympia, Washington**

[Chapter 8](#)<sup>5</sup> of Olympia, Washington's comprehensive plan addresses energy. Examples from the chapter include:

Comprehensive plan, Chapter 8, Energy (2006)

**GOAL ERG1.** To the best of our local ability, take community-level actions which will help our citizens to have a sufficient supply of energy for present and future needs.

### **POLICIES:**

**ERG 1.1** The City should promote the use of renewable and inexhaustible

<sup>5</sup>[http://olympiawa.gov/~media/Files/CPD/Planning/LongRange/Form s/CPChapter8.ashx](http://olympiawa.gov/~media/Files/CPD/Planning/LongRange/Form%20s/CPChapter8.ashx)

energy sources over non-renewable energy sources including:

- c. Pursuing renewable energy supply portfolios for the City from the power suppliers.

**ERG 1.3** The City should continue to fund and promote energy education services, including the Energy Outreach Center, in order to inform citizens on energy conservation and the use of renewable energy sources.

Pinal County, Arizona recently included an energy element in its [comprehensive plan](#)<sup>6</sup>.

### **Pinal County, Arizona.**

Comprehensive plan, Chapter 7, Environmental Stewardship (2012)

**Goal 7.3:** Improve the energy efficiency of Pinal County government.

**Objective 7.3.1:** Set an example by improving energy efficiency and use of renewable sources in County facilities, vehicle fleets, and equipment.

**Policy 7.3.1.3:** Locate solar energy generation equipment on County facilities which cost/benefit analyses prove advantageous.

**Goal 7.4:** Improve the energy efficiency of structures in Pinal County.

**Objective 7.4.1:** Improve the energy efficiency of new construction and the existing building stock through building codes and processes.

**Policy 7.4.1.2:** Encourage the expansion of energy efficient building practices.

**Policy 7.4.1.4:** Support refurbishing and remodeling projects to include energy efficiency components through expedited permitting and assistance.

**Objective 7.4.2:** Reduce energy demand through community design.

**Policy 7.4.2.1:** Encourage developments that use energy smart site design (e.g., solar orientation, cluster development).

**Goal 7.6:** Expand renewable energy in Pinal County.

**Objective 7.6.1:** Support small scale renewable energy projects.

**Policy 7.6.1.3:** Work with developers and energy providers to design neighborhoods with optimum solar orientation.

**Policy 7.6.1.5:** Develop/amend ordinances to protect solar access through sensitive building orientation and for property owners, builders and developers wishing to install solar energy systems.

## **Additional Comprehensive Plan Considerations**

Additional issues a city or county may wish to establish policy for in its comprehensive plan include distributed energy, solar access, urban forestry and balancing solar energy with other

<sup>6</sup><http://pinalcountyaz.gov/Departments/PlanningDevelopment/ComprehensivePlanUpdate/Documents/00%20Comprehensive%20Plan%202013.pdf>

community interests. Some are discussed below:

### **Distributed Energy**

Centralized energy production and fossil fuel use dominated energy development in the 20<sup>th</sup> century. Centralized energy sources include large power plants, petroleum facilities, hydroelectric dams, and other large scale sources of energy production that are often located far from areas with the greatest energy demand. Local solar energy production is a form of distributed energy, which is smaller scale energy production in locations close to consumers. Distributed energy resources support the local economy and minimize transmission distances, which increases efficiency. For more information on distributed energy, please see the discussion paper [Distributed Energy](#)<sup>7</sup>.

**“The prospects of greater energy efficiency, renewable energy sources, and decentralized energy systems offer local communities opportunities to prepare for change and to shape their own energy futures.”**

– American Planning Association

### **Solar Access**

Solar access is the ability to receive and utilize available sunlight. Solar energy systems rely on solar access to maximize performance. Solar access of existing systems can be compromised by shading from nearby vegetation and buildings. Local governments should be aware of

these issues and may decide to address solar access in the comprehensive plan.

Solar access laws can be implemented at state and local levels to protect consumers’ rights to solar system installation and operation, while preserving their access to sunlight. For Washington State solar easements and rights laws see RCW 64.04.140 and RCW 64.38.055 at DSIRE<sup>8</sup>.

As an example, the City of Olympia addresses solar access in its comprehensive plan:

### **Chapter 8, Energy (2006)**

**GOAL ERG5.** Achieve efficient use of solar energy.

**ERG 5.2** Olympia shall support efforts to protect solar access in existing structures and to incorporate solar access provisions into new development projects.

- a. The City should require all new subdivisions to maximize the number of lots with solar access.
- b. The City should establish residential height limits and setback standards which maximize solar access.
- c. The City should facilitate the recording of solar access easements, in order to guarantee access to sunlight for existing users of solar energy.

<sup>7</sup> <http://www.commerce.wa.gov/Documents/GMS-Distributed-Energy.pdf>

<sup>8</sup> [http://www.dsireusa.org/incentives/incentive.cfm?Incentive\\_Code=WA02R&re=0&ee=0](http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=WA02R&re=0&ee=0)

## Balancing Competing Interests

The comprehensive plan provides a great opportunity to balance competing interests. For example, many communities may also want to promote historic preservation, urban forestry, and the redevelopment of contaminated properties or capped landfills.



Photo source:  
<https://www.flickr.com/photos/oregondot/3077174073/in/photo stream/>

## Historic Preservation

Solar energy and historic preservation can successfully coexist in communities when both interests are addressed during the planning process. While solar systems have the potential to help older buildings meet energy goals, it is important that the installation of solar panels or related equipment does not alter the historic integrity of buildings. In some cases, ground mounted solar systems may be the best option to preserve the historic aspects of a specific structure. For more information on solar and historic preservation see the discussion paper on historic preservation<sup>9</sup> and “[Design](#)

<sup>9</sup> Link to historic preservation paper *when available*

[Guidelines for Solar Installations](#)” (National Trust for Historic Preservation<sup>10</sup>).

## Trees and Urban Forestry

Trees and solar energy are both valuable resources to communities. Both help reduce atmospheric carbon levels, yet both require access to sunlight. It is important to address urban forests and solar energy simultaneously in local plans so that each interest is protected and encouraged. When planting new trees, the species selected and placement of the trees will affect how much shade will be cast and in which direction the shade will fall. When installing new solar panels in a community, systems can be sited to minimize conflicts. If trees are removed for the sake of solar energy, planting new tree varieties in more suitable areas to ensure there is no net loss of urban forests may be an option.

Denver, Colorado is working toward a goal of planting a million trees and installing solar on a million roofs while avoiding conflict between each interest<sup>11</sup>. For more information on policies regarding solar and urban forests see “[Trees and Solar Power Coexisting in an Urban Forest Near You](#)” (Dan Staley, 2012<sup>12</sup>).

<sup>10</sup> <http://www.preservationnation.org/information-center/sustainable-communities/buildings/solar-panels/design-guidelines-for-solar.html>

<sup>11</sup> Video: A Million Trees and A Million Roofs: Can We Have Both? <http://solarcommunities.org/solar-communities-video/#trees>

<sup>12</sup> <http://danstaley.net/Staley%202012%20Trees%20And%20Solar%20Power%20Coexisting%20in%20an%20Urban%20Forest%20Near%20You%200012%20WREF%20Solar%202012%20FINAL.pdf>

## **Private Covenants or Restrictions**

The installation of solar systems may be restricted or prohibited entirely by existing constraints from neighborhood or condominium codes, covenants, and restrictions. For more information, please see [Addressing Rooftop Solar for Condo Associations](#) and [Addressing Rooftop Solar for HOAs](#).

## **Comprehensive Plan Examples that Address Solar Energy**

- City of Chico, CA: 2011 *General Plan*. Chapter 2, Sustainability. Chapter 8, Housing Element.
- City of Corvallis, OR: 1998 *Comprehensive Plan*. Article 12, Energy.
- Town of Hartford, VT: 2012 *Master Plan*. Chapter X, Energy.
- City of Lowell, MA: 2013. *Sustainable Lowell 2025*. Part IV, Goals; Housing Choice. Environmental Resilience.
- Town of Mammoth Lakes, CA: *Town of Mammoth Lakes General Plan 2007*. Resource Management and Conservation.
- City of Milwaukee, WI: 2010 *Milwaukee Comprehensive Plan: Citywide Policy Plan*. Housing and Neighborhoods; Natural Resources.
- City of Minneapolis, MI: 2009 *Minneapolis Plan for Sustainable Growth*. Part 6, Environment.
- City of Olympia, WA: 2006 *Comprehensive Plan*. Chapter 8, Energy.
- City of Orlando, FL: 2012 *Growth Management Plan*. Conservation Element: Goals, Objectives, and Policies.
- Pinal County, AZ: 2009 *We Create Our Future: Pinal County Comprehensive Plan*. Chapter 7, Environmental Stewardship – Energy.
- City of Pleasanton, CA: 2009 *Pleasanton General Plan 2005 – 2025*. Energy Element.
- Prince William County, VA: *Prince William County 2008 Comprehensive Plan*. Environment Element – Energy Policies and Action Strategies.
- City of Scottsdale, AZ: 2001 *Scottsdale General Plan*. Preservation and Environmental Planning Element.
- City of Shakopee, MN: 2009 *Comprehensive Plan 2030*. 12, Solar Access.

## **Summary of Resources**

- American Planning Association, *Planning for Solar Energy*, report 575
- American Planning Association, *Planning for Solar Energy*, briefing papers
- “Design Guidelines for Solar Installations” (National Trust for Historic Preservation)
- DSIRE - Database of State Incentives for Renewable Energy  
<http://www.dsireusa.org/solar/>
- Washington State Department of Commerce, Growth Management

Services Unit, [Energy Aware Communities](#) webpage

- Planning and Zoning: An Opportunity for Local Governments to Support Rooftop Solar [report](#), March 2013
- Smart growth/Smart energy toolkit [http://www.mass.gov/envir/smart\\_growth\\_toolkit/](http://www.mass.gov/envir/smart_growth_toolkit/)
- “Trees and Solar Power Coexisting in an Urban Forest Near You” (Dan Staley, 2012)