



## Solar Water Heating Systems

This **Advanced Method and Material** was developed jointly by the City of Bellingham Building Department and Sustainable Connections to assist and encourage private electric generation capability while assuring that such electric generation capability does not create structural, fire or life safety hazards.



## BENEFITS

From 2007 to 2009 Bellingham was the #1 EPA certified Green Power Community in America. In 2009, Bellingham ranked as the #1 Small City by the NRDC Smarter Cities Program. The many benefits of solar hot water systems include:

- ❖ Lower energy bills and energy conservation
- ❖ Clean energy production that helps meet green house gas reduction targets and climate action goals
- ❖ savings of over 50% in hot water heating costs
- ❖ Power for secure, local energy

Solar water heaters—also called solar domestic hot water systems can be a cost effective way to generate hot water for your home. Solar water heating systems include storage tanks and solar collectors. There are two types of solar water heating systems: active, which have circulating pumps and controls, and passive, which don't.

Most solar water heaters require a well-insulated storage tank. Solar storage tanks have an additional outlet and inlet connected to and from the collector. In two-tank systems, the solar water heater preheats water before it enters the conventional water heater. In one-tank systems, the back-up heater is combined with the solar storage in one tank.

## POLICY/CONDITIONS

The installation of roof mounted solar heat collectors meeting all of the following criteria will not create a requirement for structural review or a building permit.

- Total dead load of panels, supports, mountings, raceways and all other appurtenances weighs no more than four pounds per square foot.
- The total solar collector system weight will not exceed 1,000 pounds.
- Panels are to be mounted no higher than 18" above the plain of the roof to which they are affixed.
- Supports are installed to spread the dead load across as many roof framing members as needed to ensure that no point loads in excess of fifty pounds are created.
- All components of the solar collection system must meet the requirements of the UPC.
- Heat exchangers will be double wall with a clear path of heat detection or single wall heat exchangers must meet all requirements of UPC Appendix L 5.0
- Attachment to the roof will be as specified by the mounting system manufacturer.
- All portions of the system must remain at or below height limitations of any code or regulation enforced by the City of Bellingham.

## SCOPE

Single-family, two-family and townhome buildings which fall under the scope of the International Residential Code.

## DEFINITIONS

IRC: International Residential Code  
UPC: Uniform Plumbing Code.

## PERMIT REQUIREMENTS

In general, the person installing the solar system obtains any required permits. For specific information applicants should contact the **COB Permit Center/Building Services Division** for more information: (360) 778-8300 or [permits@cob.org](mailto:permits@cob.org).



## Solar Water Heating Systems (cont'd)

- In portions of the City where design review is required for building modifications, such design review approval must be obtained prior to installation of solar water heating systems.
- Electric permits and inspection approvals are required for all solar water heating systems installations that connect to the building's electric system.
- Plumbing permits and inspection approvals are required for all solar water heating systems that connect to the building's potable water system.

### RATIONALE

Lightweight solar collectors pose no significant structural risk when installed in accordance with the manufacturer's instructions. The UPC provides adequate safeguards of the potable water system.

### REFERENCES / SOURCES

*UPC Appendix L*

*Seattle Department of Planning and Development*

### FINANCIAL INCENTIVES

#### Federal Tax Credit

Individuals and businesses that install solar energy systems are eligible for a federal tax credit of 30% of the system cost (the total of installation and materials). Individuals use Residential Energy Credits IRS Form 5695 and businesses use the Investment Credit IRS Form 3468. Updated forms can be found on the IRS website, [www.irs.gov](http://www.irs.gov)

#### State Sales Tax Exemption

Beginning July 1, 2009, solar electric systems are eligible for a partial reduction or exemption from state sales taxes, depending on the system's size and year of installation. Consult your contractor for details on this tax exemption. The tax reduction/exemption is scheduled to expire June 30, 2013. More information available at [www.seattle.gov/light/solar](http://www.seattle.gov/light/solar).

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### ADDITIONAL RESOURCES

#### Northwest Solar Center

A program of the WSU Cooperative Extension Energy Program, the Center provides solar energy resources and educational opportunities. (206) 396-8446 [www.northwestsolarcenter.org](http://www.northwestsolarcenter.org)

#### Solar Washington

The local chapter of the American Solar Energy Society, which promotes the development of solar and renewable energy through education and training. Events, articles, newsletter and links are posted on the web. [www.solarwashington.org](http://www.solarwashington.org)

#### US Department of Energy Efficiency and Renewable Energy

This division of the Department of Energy has a focus on enhancing renewable and sustainable energy production. Their web site provides a wealth of information and links to information on types of energy, state information, funding and a consumer guide. [www.eere.energy.gov](http://www.eere.energy.gov)

#### Energy Star

Energy Star is a joint program of the U.S. Department of Energy and the U.S. Environmental Protection Agency, providing consumer information on energy efficient products and practices. [www.energystar.gov](http://www.energystar.gov)

