



Solar Water Heating Systems

Oregon Department of Energy

The Oregon Residential Energy Tax Credit Program provides a tax credit for solar domestic water heating systems of 60 cents per kilowatt hour (kWh) saved during the first year of operation, up to \$1,500. Spa and pool heating systems are eligible for a tax credit of 15 cents per kWh saved, up to 50 percent of the cost, with a maximum tax credit of \$1,500.

The solar water heating system must be located in an Oregon dwelling that is your primary or secondary residence.

To qualify for a tax credit, you must have an Oregon income tax liability. You claim the tax credit when you file your state income tax. If you are an Oregon resident and do not have an Oregon income tax liability, you may choose to transfer your tax credit to an Oregon resident who does. The Pass-through Option will allow you transfer your tax credit to an individual or business with an Oregon tax liability who will make a lump-sum payment to you equal to 95 percent of the certified tax credit amount. To use this option, complete this application form first. Your application will be reviewed for eligibility. A Pass-through Option Application will be sent to you in return. You and your pass-through partner (the tax credit recipient) will complete and sign the Pass-through Option Application and mail it to the Oregon Department of Energy. You are responsible for finding your own pass-through partner. The Department of Energy will then issue the tax credit certification to the pass-through partner. There may be tax implications for the pass-through partner. We advise you to consult with your tax preparer.

Don't wait to apply for the tax credit. The Oregon Department of Energy should receive the application **no later than April 1** of the year following the purchase to get a tax credit Certificate back by the April 15 filing deadline.

Take the following steps to receive your tax credit:

- 1. Complete a sun chart for your location.** Use the attached sun chart worksheet to determine how much solar energy your system receives.
- 2. Determine the first-year kWh savings and tax credit amount.**

Domestic Water Heating Systems

Look up the kWh/year savings for your solar water heating system and climate zone in the Yield Table for Solar Domestic Water Heaters provided in the Solar Water Heating Information Packet from the Oregon Department of Energy. Adjust this value by the percent loss due to the shading and orientation determined by the sun chart. Multiply by \$0.60 to determine the qualifying tax credit amount, up to \$1,500. Any system that is not OG 300-Certified by the Solar Rating and Certification Corp. (SRCC) must be pre-approved by the Oregon Department of Energy to be eligible for the tax credit.

Spa Heating Systems

Look up the kWh/year savings in the Yield Table for Solar Spas. Adjust this value by the percent loss due to shading determined by your sun chart. Multiply by \$0.15 to determine the qualifying tax credit amount, up to 50 percent of the cost of the system.

Pool Heating Systems

Use the equation in the Yield Table for Solar Pools to determine the first-year kWh savings. Adjust this value by the percent loss due to shading determined by the sun chart. Multiply by \$0.15 to determine the qualifying tax credit amount, up to 50 percent of the cost of the system.

- 3. Submit a completed Application and Verification Form for Tax Credit Certification Solar Water Heating System.** The form may be filled out on your computer. Please print it, sign it and mail it with your receipt to the Oregon Department of Energy. The forms can NOT be filed on-line. If your system is installed by a contractor that is tax credit certified by the Oregon Department of Energy, the contractor will help you complete the application. Attach proof of payment (receipt or invoice marked "paid" that is signed and dated by the contractor.)
- 4. Complete the pass-through option section on the form if you are using this option.** The pass-through option allows an applicant to transfer the tax credit to a pass-through partner in return for 95 percent of the value of the tax credit. If you choose the pass-through option, you transfer your tax credit and may not claim it. The tax credit is issued in the name of the pass-through partner. Check the pass-through option section and submit your completed application. The Department of Energy will review your application and send you a Pass-through Option Application form and additional instructions. You and your pass-through partner (the tax credit recipient) must sign the form. You must find your own pass-through partner. There may be tax implications for the pass-through partner. We advise you to consult with your tax preparer.
- 5. Claim the tax credit on your state income tax form.** Keep your Certification, a copy of your application, and proof of payment with your tax records. (Do not attach them to your tax return.) If your return is audited, the Oregon Department of Revenue will request copies of the information from you. Tax credits not taken in the first year may be carried forward up to five years.

If you have any questions, please call the Oregon Department of Energy toll-free: 1-800-221-8035. (In Salem, call 503-378-4040.) Or consult the Department of Energy Web site (www.oregon.gov/energy).

If you have questions concerning claiming the credit on your Oregon tax return, contact the Oregon Department of Revenue at 1-800-356-4222 or 503-378-4988.

Tips for Buying, Installing, and Operating a Solar Water Heating System

- Ask how much experience the contractor has installing solar water heating systems. Ask for references and check them.
- If you are purchasing a solar water heating system from a tax credit certified solar contractor, ask to see proof of his/her contractor certification from the Department of Energy.
- Check that the system is OG 300-certified and installed in accordance with the Oregon Solar Energy Industry Association tank insulation standard. For more details, check the Web site: www.solar-rating.org.
- Be sure you understand how to operate and maintain your system, including what steps to take to avoid freezing or overheating. Your contractor should provide you with an owner's manual with operation and maintenance instructions. In the rare event that your system freezes or overheats, know what steps to take to shut off or bypass your system.
- Compare annual performance estimates of different models you are considering. These values are shown on the Department of Energy solar water heating yield tables.
- Set the thermostat to 125°F. and install low-flow showerheads on all showers.



Application and Verification Form
for Residential Energy Tax Credit Certification

Solar Water Heating System

Oregon Department of Energy

625 Marion St. NE
Salem, OR 97301-3737
Toll-free: 1-800-221-8035
Salem: (503) 378-4040 Fax (503) 373-7806
Web site: www.oregon.gov/energy

Don't forget...
...to sign your application
and include your receipt

1. APPLICANT INFORMATION

Name:		Social Security No.*:	
Mailing address:		Daytime phone:	
City:	Oregon County:	State:	Zip:
Site address (if different):			
City:	Oregon County:	State:	Zip:
If different than mailing address, please explain:			
Name of electric utility company:			
Name of natural gas utility company:			
Installation date:		Number of people in household:	
Cost of system: \$			

2. SYSTEM DESCRIPTION

System Type (check one)

Solar domestic water heater

Solar pool heating system

Spa heating system

System Configuration (check one, and circle type)

Active (Drainback, Antifreeze, Open-loop, Other)

Passive (Thermosyphon, Geyser pump, Batch, Other)

*OAR 330-070-0025 authorizes the Oregon Department of Energy to request that you voluntarily provide your social security number for use as an identification number in maintaining internal records and may be shared with the Department of Revenue to establish the identity of an individual in order to administer state tax law. If you provide your social security number and consent to its use, it will be used only for the purpose(s) stated above.

FOR OFFICE USE ONLY

File no.:
Date received:
Tax credit amount: \$
Tax year:

2. SYSTEM DESCRIPTION (Continued)

General Information

1. Collector tilt _____ degrees from horizontal
 2. Collector orientation _____ degrees East or West of true South
 3. System manufacturer _____ Model _____

Solar Domestic Water Heating Systems (only)

4. SRCC OG-300 No. _____
 5. Collector manufacturer _____
 6. Collector model number _____ Area of one panel _____ sq/ft
 7. Number of collectors _____ Total area _____ sq/ft
 8. Solar storage tank manuf. _____ Model _____
 9. Controller manufacturer: _____ Model _____
 10. Pump manufacturer _____ Model _____
 11. Heat exchanger manuf. _____ Model _____

Pool Heating System (only)

12. Collector manufacturer _____
 13. Collector model number _____ Area of one panel _____ sq/ft
 14. Number of collectors _____ Total area _____ sq/ft
 15. Pool location (check appropriate): indoor outdoor above-ground below-ground
 16. Pool area _____ sq/ft Pool volume _____ gallons
 17. Is a cover used? Yes No
 18. Pool insulation (R-value) _____ hr-sq/ft-F/Btu

Spa Heating System (only)

19. Total collector area _____ sq/ft
 20. Spa volume _____ gallons
 21. Is a cover used? Yes No

3. SYSTEM PERFORMANCE ESTIMATION

Shading Impact

22. Loss from external shading (% loss on annual output - from sun chart) %
 23. Shading factor (100% - line 22) %

Tilt and Orientation Factor (TOF)

24. Tilt and orientation factor (from TOF graph) %

Total Solar Resource Fraction (TSRF)

25. Total solar resource fraction (TSRF = line 23 x line 24) %

Estimated Annual Production

26. System yield (see climate zone and yield table on Web) kWh/terms
 27. Estimated annual savings (line 25 x line 26) kWh/terms

4. TAX CREDIT CALCULATION

If TSRF \geq 75%	Tax credit = System yield x tax credit rate ¹	= \$ _____
If TSRF \geq 50% but < 75%	Tax credit = System yield x 0.75 x tax credit rate ¹	= \$ _____
If TSRF < 50 % system is not eligible	Tax credit = \$0.00	\$ _____

¹ The tax credit rate for Solar water heating is \$0.60/kWh, and the amount of the tax credit may not exceed 100 percent of the cost of the system. The tax credit rate for pools and spas is \$0.15/kWh, and the amount of the tax credit may not exceed 50 percent of the cost of the system. No tax credit amount may exceed \$1,500.

5. PASS-THROUGH OPTION

Yes - I want to transfer my tax credit to another Oregon resident (see below)

No - I want to keep the full tax credit myself

If you are an Oregon resident, the Pass-through Option will allow you transfer your tax credit to an individual with an Oregon tax liability who will make a lump-sum payment to you equal to 95% of the certified tax credit amount. To use this option, complete this application form first. Your application will be reviewed for eligibility. A Pass-through Option Application will be sent to you in return. You and your pass-through partner (the tax credit recipient) will complete and sign the Pass-through Option Application and mail it to the Oregon Department of Energy. The Department of Energy will then issue the tax credit certification to the pass-through partner. **Important: There may be tax implications for the pass-through partner. We advise you to consult with your tax preparer.**

6. INSTALLER SIGNATURE

Please have installer read and complete this section. If homeowner installed the system, he/she must complete.

I certify that the system(s) described in this application is (are) installed and that the information contained herein is accurate and true. Complete and initial each item below:

_____ The owner has received proper instruction for the operation and maintenance of the system.

_____ The owner has received a system manual and an estimate of the annual energy savings.

_____ The owner has received a written _____ month full warranty for the system. Department of Energy Tax Credit Certified Contractors are required to provide at minimum a 12-month full warranty. The Oregon Department of Energy recommends a minimum 24-month full warranty on all parts and labor.

_____ If solar domestic water heating, the system **has been properly permitted and inspected** by your local jurisdiction

_____ Was installed in accordance with SRCC OG-300 approved specifications.

I declare that this system meets all the requirements of ORS 469.160 through 469.180 and complies with all local building code requirements. Should the Oregon Department of Energy require changes in the system to make it conform to ORS 469.160 through 469.180 and OAR 330-70-010 through 330-70-097, the installer/contractor agrees to make such changes. By signing below, I certify that the system described in this application is installed and that the information contained herein is accurate and true.

Installation company: _____

Installation company address: _____

City: _____ State: _____ Zip: _____ Phone: _____

Installer name (please print): _____

CCB no.: _____ Oregon Department of Energy Tax Credit Certified? Yes No

Installer's signature: _____ Date: _____

7. DECLARATION, VERIFICATION AND APPLICATION SIGNATURES

I understand that the Oregon Department of Energy does not make any warranty concerning the performance, operation, installation, or any other characteristic or feature of this system. Department of Energy approval is only for purposes of obtaining the Oregon Residential Energy Tax Credit. By signing below, I (we) certify that the system(s) described in this application is (are) installed and that the information contained herein is accurate and true. System Owner must initial each item below:

_____ I give the Oregon Department of Energy permission to inspect this installation upon agency request.
Note: Refusing access for inspection may result in denial of this application.

_____ The installer has provided me with an owner's manual, a written warranty and instructed me in its proper operation.

_____ I have completed the attached sun chart for the site where this system is installed.

_____ I have set the backup tank temperature to 125°F as required.

_____ **I have attached proof of payment** for this installation (an **itemized** receipt of payment from your contractor, marked "paid" and dated; a copy of the contract with your utility for the system; or, for do-it-yourself systems, an itemized receipt of payment for materials).

Have you received a prior tax credit through the Oregon Residential Energy Tax Credit Program in this tax year? Yes No If yes, for what type of system(s)? _____

We do not sell information from this application as a mailing list. However, the Oregon Department of Energy may be required to disclose the name, address and phone number from your application under the Oregon Public Records law ORS 192.410 et seq. We can withhold the address and phone number following a written request explaining personal safety concerns, such as a temporary restraining order. The Oregon Department of Energy does not endorse any company that requests the information.

Signature of Purchaser: _____ Date: _____

Signature of Joint Purchaser: _____ Date: _____

Complete the following if two or more persons are purchasing this system and file separate tax returns.

Name: _____ Address: _____ % ownership: _____

Name: _____ Address: _____ % ownership: _____

Name: _____ Address: _____ % ownership: _____

Note: The Oregon Department of Energy certifies the energy efficiency of systems and equipment for the Oregon Residential Energy Tax Credit program. It is the applicant's responsibility to ensure compliance with all other eligibility requirements. If you have questions concerning claiming the credit on your Oregon tax return, contact the Oregon Department of Revenue at 1-800-356-4222 or 503-378-4988.



Sun Chart Worksheet

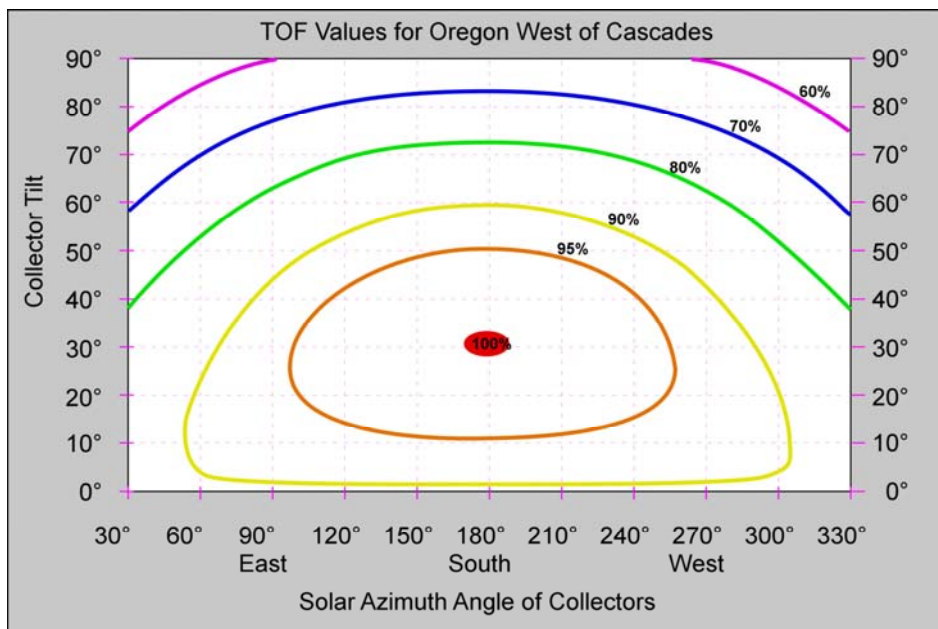
A tool for estimating the impact of collector tilt, orientation and shading

To estimate the performance of a solar energy system we need to know how much solar energy is available for your collector. This worksheet is used to estimate the impact of tilt, orientation and external shading on how much solar energy your solar collectors can collect. The Total Solar Resource Fraction (TSRF) represents the fraction of energy a particular collector would receive when compared to one in the same city, but that has optimal tilt, orientation and no external shading. For example, a collector with a TSRF of 80 percent indicates that 80 percent of the solar energy at your location over a year will be available to the solar collector.

For simplicity we have separated calculating the TSRF into two parts. The first part is to determine the impact of collector tilt and orientation. This Tilt and Orientation Factor (TOF) is estimated using one of the following plots. The second part is to use the a sun chart to estimate how much energy is lost on an annual basis from external shading from plants, buildings or other obstructions. The combination of these two effects will provide your collector's TSRF.

TOF graphs (right) show the impact of tilt, and orientation on annual performance of a solar collector. TOF values range from 100% (no loss) at the center of the inner circle to less than 60% (40% or more loss) in the upper left and right corners.

Use the upper graph if your system is installed West of the Cascades. Use the lower graph if your system is installed East of the Cascades.

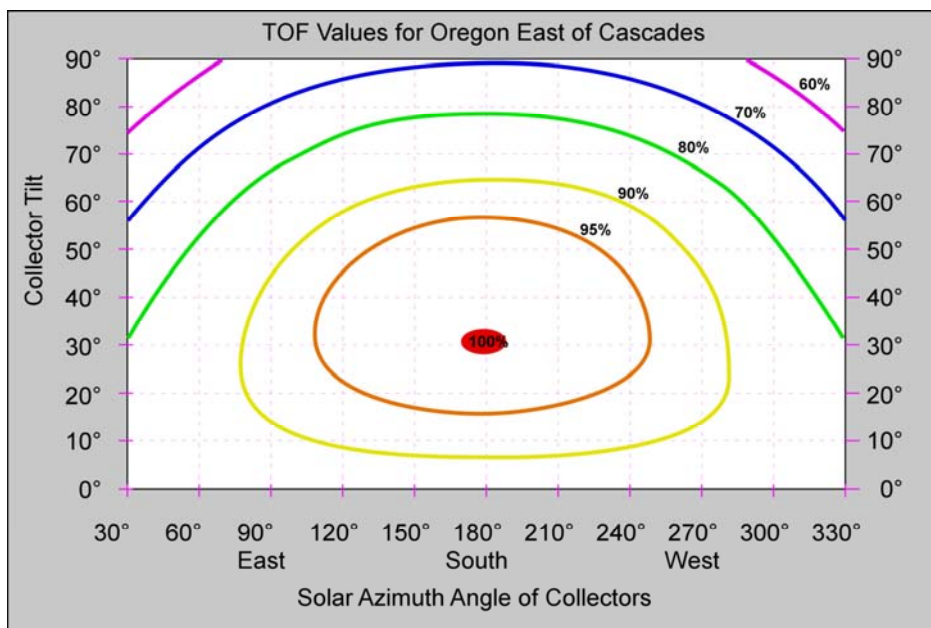


Draw a dark **X** mark the graph for your collector's tilt and azimuth angle. Interpolate between the nearest two lines to estimate the TOF value to the nearest 1%.

Collector Tilt = _____ °
(angle from horizontal)

Solar Azimuth = _____ °
(collector orientation)

TOF = _____ %
(estimated from graph)




Sun Chart

For solar water heating and PV

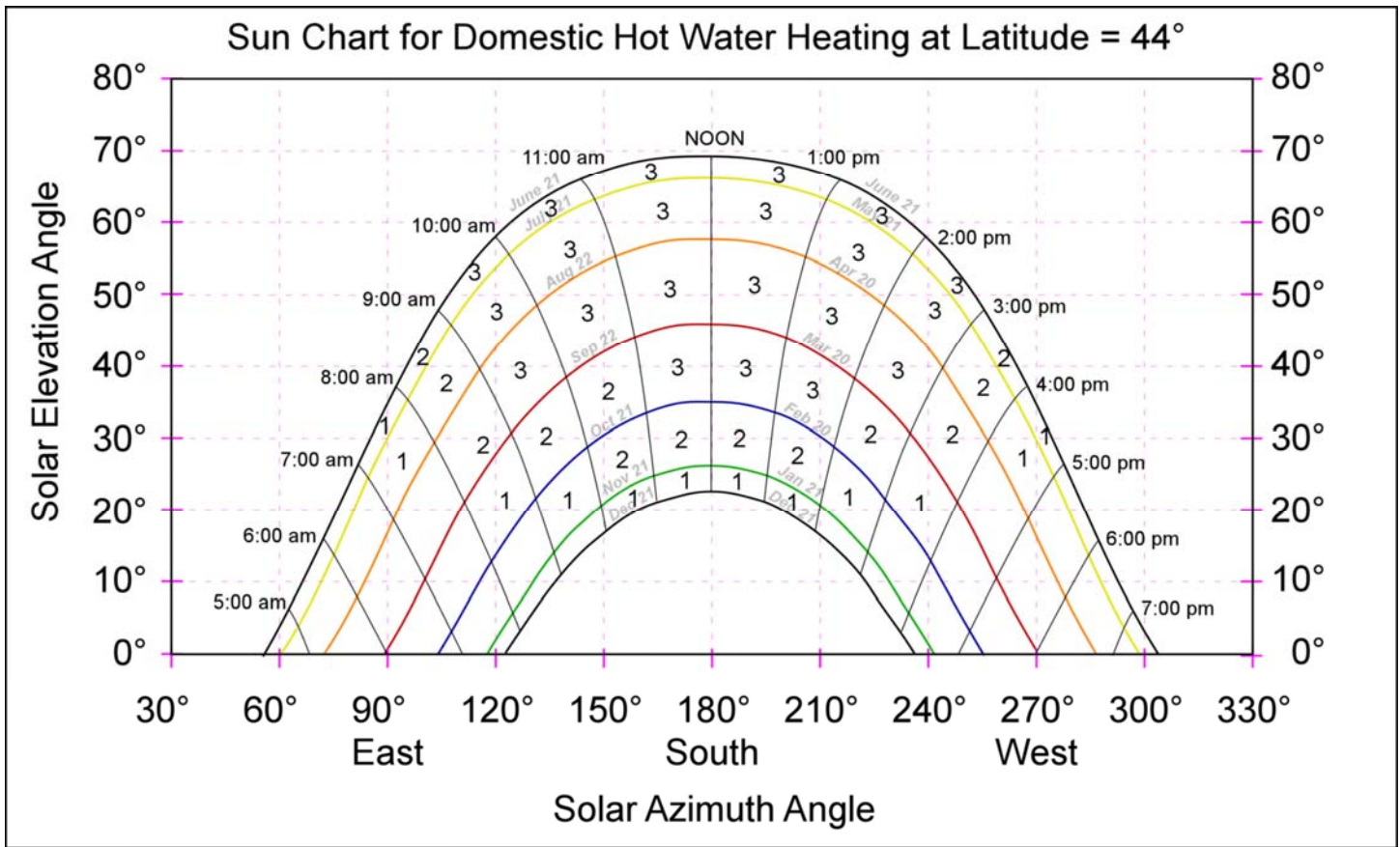
Step 1 – In the box provided right, sketch the roof layout and location of the solar collector.

Roof Layout Sketch



North

Step 2 – From the midpoint of the solar array, draw the skyline on the graph below. Use the elevation angles and solar azimuth angles to determine the location of the obstructions. Draw deciduous trees with a dotted outline and fill with light shading. Year-round (solid) obstructions like buildings, or conifer trees should be drawn with solid outlines and filled with heavy shading.



Step 3 – Add up the solar fraction numbers in the sections that have shading. You can use fractional values if the obstruction only covers a part of a section. In addition, any deciduous tree shading below the Sept 22/March 20 line can be counted at half value to account for the fact that some light will get through these obstructions when the trees lose their leaves. This sum of all these values is the “Shading Fraction”. It represents the percent of energy lost to external shading for space heating systems. Subtract this number from 100 percent to get the Prime Solar Fraction (PSF). $PSF = 100\% - \text{Shading Fraction} = \underline{\hspace{2cm}}\%$

Step 4 – Calculate the Total Solar Resource Fraction using the following equation:

Total Solar Resource Fraction = Prime Solar Fraction x Tilt and Orientation Factor

$TSRF = PSF \times TOF = \underline{\hspace{2cm}}\% \times \underline{\hspace{2cm}}\% = \underline{\hspace{2cm}}\%$