



Solar Water Heating System

Oregon Department of Energy

ELIGIBILITY – To qualify for a tax credit, you must have an Oregon income tax liability. The solar water heating system must be attached to real property (e.g. no RVs or house boats) associated with you primary or secondary residence. **The system must be either OG-300 certified by the Solar Rating and Certification Corporation** or be pre-approved as a “Research and Development” system by ODOE staff. Download the solar water heating “yield table” from the ODOE web site to compare system performance and verify a system is eligible **before you purchase it**. The tax credit is claimed when you file your state income tax. Systems must be installed according to state license and permitting laws.

CREDIT AMOUNT - The Oregon Residential Energy Tax Credit Program provides a tax credit for solar water heating systems based on estimated annual savings. The savings for each qualifying system can be found the solar water heating system “Yield Table” table off the Department’s Web site. The credit is based on \$0.60 per kwh saved up to 2,500 kwh. The maximum credit that can be claimed for any system is \$1,500 or 50 percent of the cost which ever is less. The amount of the tax credit may be reduced if the system has losses from sub-optimal tilt, orientation or external shading. The attached “sunchart” worksheet is used to determine the combined impact of tilt, orientation and external shading on system performance.

SYSTEM VERIFICATION – An Oregon Department of Energy tax credit certified solar thermal technician must install or verify installation of the system to qualify for the tax credit. A list of companies that employ tax credit certified solar thermal technicians can be found on the Oregon Department of Energy’s Web site. Homeowners, who install their own solar thermal systems or use a solar thermal technician who is not tax credit certified, should contact a tax credit certified solar thermal technician to verify that their system meets Residential Energy Tax Credit standards. For homeowners who live in areas where there is no tax credit certified solar thermal technician within 100 miles, please call the Oregon Department of Energy (1-800-221-8035) to discuss verification of the system.

PASS-THROUGH OPTION – 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 or business that 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 based on a percentage 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. We advise you to consult with your tax preparer.

PROCESS – 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. **Submit a completed Application and Verification Form for Tax Credit Certification Solar Water Heating System.** Your tax credit certified solar technician should complete the technical sections, sun chart, and the technician verification section of the form. Once completed, mail the signed application to the

Oregon Department of Energy. Include the sun chart, proof of payment (dated receipts, contracts, or invoices marked paid by your technician). If the paperwork you submit demonstrates that your system qualifies for the tax credit, the Oregon Department of Energy will approve your application and send you a signed Certification specifying the qualifying tax credit amount.

2. **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 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.

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).





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 (Homeowner completes)			
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 electricity utility company:			
Name of natural gas utility company:			
Installation date:		Number of people in household:	
Cost of system: \$			
2. SYSTEM DESCRIPTION (Technician completes)			
System Type (check one)			
<input type="checkbox"/> Glycol <input type="checkbox"/> Drainback <input type="checkbox"/> Thermosyphon <input type="checkbox"/> Other			
System Certification (OG-300 or R&D)			
1. System manufacturer: _____			
2. Model: _____			
3. Certification Number: _____			

* The request for your Social Security Number is authorized by Section 405, Title 42, of the United States Code. You must provide this information. It is used to establish your identity for tax purposes only.

FOR OFFICE USE ONLY
File no.:
Date received:
Tax credit amount: \$
Tax year:

2. SYSTEM DESCRIPTION (Continued)

Solar Collector (Panels)

4. Collector manufacturer: _____ Model: _____
5. Collector area (each) _____ ft²
6. Number of collectors: _____
7. Total collector area (line 5 x line 6): _____ ft²

Balance of System

8. Controller manufacturer: _____ Model: _____
9. Solar storage tank manufacturer: _____ Model: _____
10. Heat exchanger manufacturer: _____ Model: _____

3. SYSTEM PERFORMANCE ESTIMATION (Technician completes)

Tilt and Orientation Factor (TOF)

11. Tilt of collector surface..... _____ degrees
12. Orientation of solar modules (0 = North, 90 = East, 180 = South, 270 = West) _____ degrees
13. Tilt and Orientation Factor (from TOF graph) _____ %

Shading Impact

14. Percent not shaded (From Sun Chart Worksheet) _____ %

Total Solar Resource Fraction (TSRF)

15. Total Solar Resource Fraction (line 13 x line 14) _____ %

(example if TOF = 84% and percent not shaded = 95% then TSRF = $0.84 \times 0.95 = 0.798 = 79.8\%$)

Estimated Annual Production

16. Yield Table¹ value for appropriate climate zone² kWh
17. Estimated Annual Production (line 15 x line 16) kWh

4. TAX CREDIT CALCULATION (Technician completes)

If **TSRF** \geq 75% Tax Credit = line 16 x \$0.60 = \$ _____

If **TSRF** \geq 50% but $<$ 75% Tax Credit = line 16 x \$0.45 = \$ _____

If **TSRF** $<$ 50 % system is not eligible Tax Credit = \$0.00 \$ _____

AMOUNT MAY NOT EXCEED \$1,500

¹ Yield Table can be downloaded from the ODOE Web site. It contains the annual energy savings for all approved solar water systems.

² Solar water heating systems vary by local climate. Oregon has three primary solar water heating climate zones. The yield values are differentiated by three different climate zones.

5. PASS-THROUGH OPTION (Homeowner completes)

No - I want to keep the full tax credit myself

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

If you are an Oregon resident, 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 a percent of the certified tax credit amount (amount determined by Oregon Department of Energy). 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 Oregon Department of Energy will then issue the tax credit certification to the pass-through partner. .

Important: The pass-through is a one-time transfer and is final. There may be tax implications. We advise you to consult with your tax preparer.

6. TECHNICIAN VERIFICATION (Technician completes, homeowner reviews)

To be completed by a tax credit certified solar thermal technician who should **initial** if statements are **TRUE**. Homeowners who live in areas where there is no tax credit certified solar thermal technician within 100 miles, please call the Oregon Department of Energy (1-800-221-8035) to discuss verification of the system.

Annual Energy Production and Savings

1. If backup water heater is tank type, the thermostat is set to 120 degrees.
2. Estimated annual useful energy production of system: _____ kWh per year
3. Value of this energy at 8 cents per kWh = \$ _____ per year

System Documentation

4. The owner has received a system manual and instruction for the regular and emergency operation and required maintenance of the system.
5. The system has been properly permitted and inspected by local code jurisdiction.
Jurisdiction: _____ Permit number: _____

System Quality and Longevity

6. The system is designed for optimal energy performance, safety and longevity.
7. The owner has received a written _____ month full warranty for the system. Oregon Department of Energy Tax-Credit Certified Technicians are required to provide at minimum a 24-month full warranty (all parts and labor).

I verify the above seven items are true and 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/technician agrees to make such changes. By signing below, I certify that the system described in this application is installed and that **ALL the information contained herein is accurate and true.**

Tax credit certified technician's name (please print): _____

Tax credit certified technician's company: _____

Tax credit certified technician company CCB no.: _____ Phone No.: _____

Tax credit certified technician's signature: _____ **Date:** _____

7. HOMEOWNER APPLICATION SIGNATURE (Homeowner completes)

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.

_____ 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 tax-credit certified solar technician and the technician's employer have provided me with an owner's manual, a written warranty and instructed me in its proper operation. Please review section 6 of this application to ensure you agree with technician's claims.

_____ **I have attached proof of payment** for this installation that includes an **itemized parts list**.
(e.g. receipt of payment or a copy of the contract for the system marked "paid" and dated; or, for do-it-yourself systems, an itemized receipt of payment for materials).

What were you told the approximate savings by this system would be? \$ _____ per year

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.



Solar Site Assessment

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 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.

Azimuth angles are based on true polar orientation, adjusted for magnetic declination (16-20 degrees for most of Oregon)

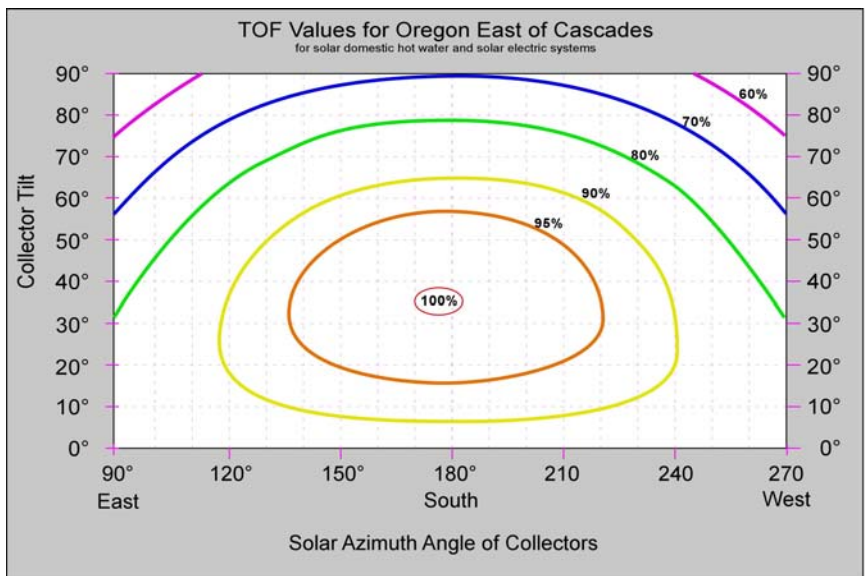
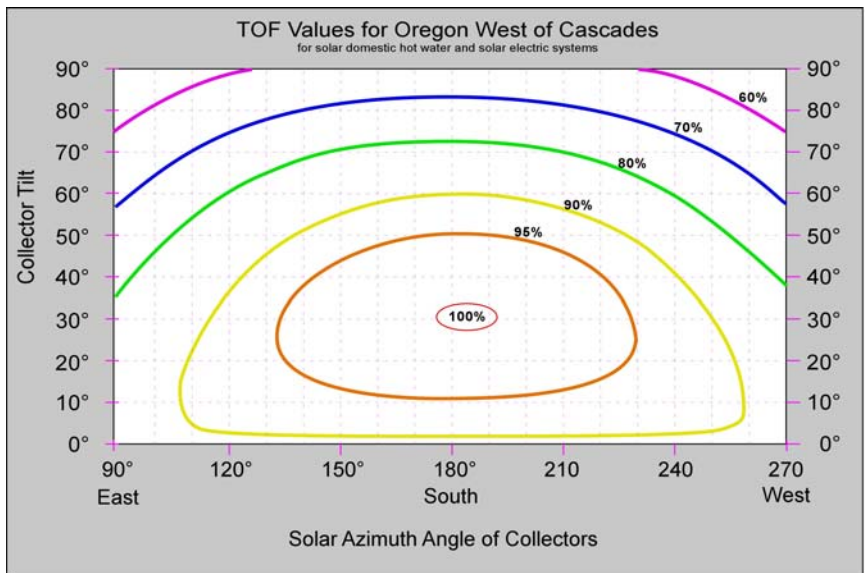
Use the upper graph if your system is installed West of the Cascades.
Use the lower graph if your system is installed East of the Cascades.

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)

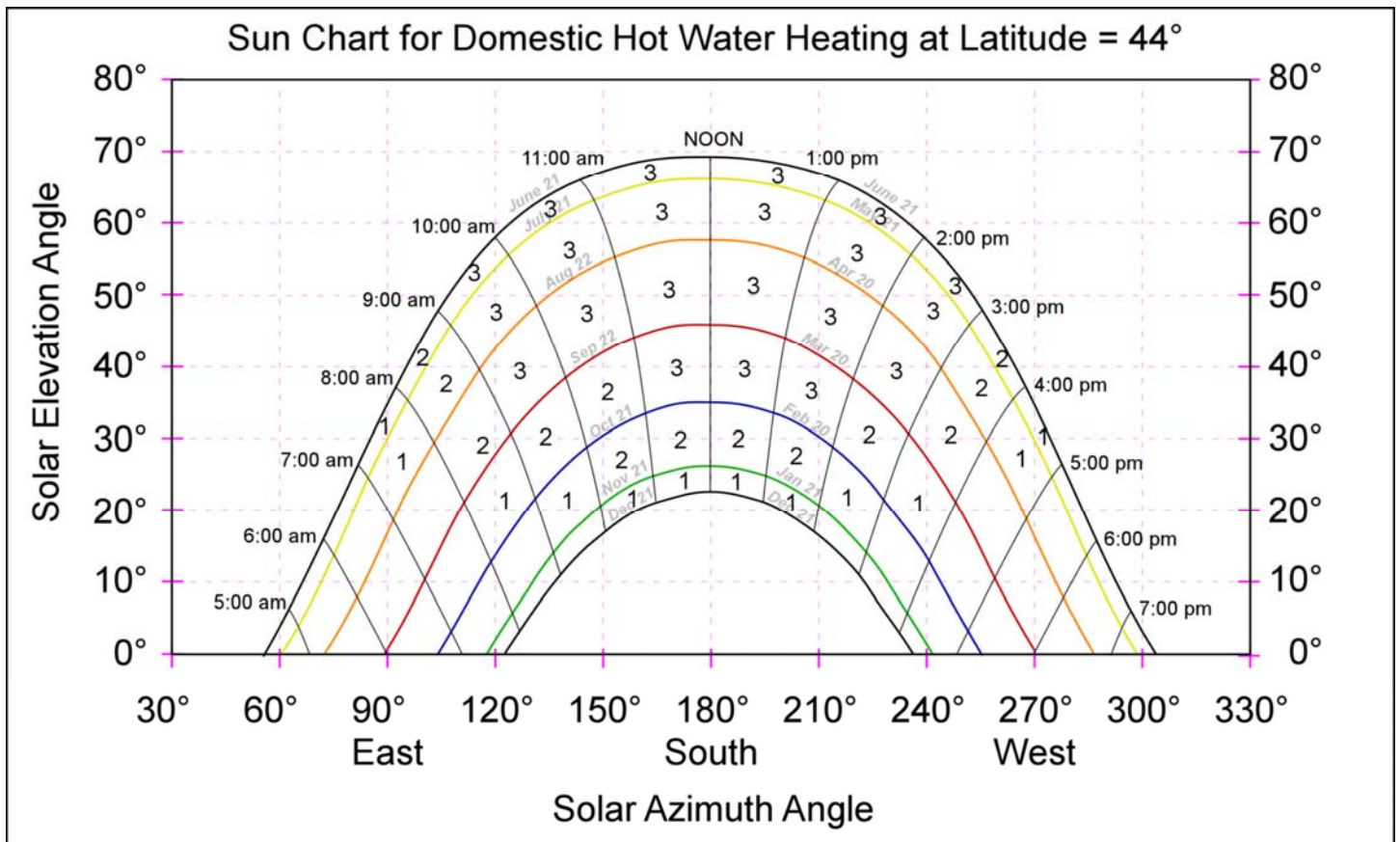
TOF = _____ %
(estimated from graph)



Sun Chart

For solar water heating and solar electric systems

Step 1 – 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. A solar site assessment tool such as the Pathfinder™, or Solmetric Suneye is recommended for increased accuracy. Energy Trust of Oregon sun charts can be used in lieu of the sun chart below. Draw deciduous trees with a dotted outline and fill with light shading. Year-round obstructions like buildings, or evergreen trees should be drawn with solid outlines and filled with heavy shading.



Step 2 – Add up the solar fraction numbers in the sections that have shading. For solar electric systems, partial shading in one section must be counted fully (no fractional amounts). 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 inside the obstructed areas is the percent of energy lost to external shading.

$$\text{Percent Not Shaded} = 100\% - \text{Sum of obstructed areas} = \underline{\hspace{2cm}}\%$$

Step 3 – Calculate the Total Solar Resource Fraction using the following equation:

$$\text{Total Solar Resource Fraction} = \text{TOF} \times \text{Percent Not Shaded} = \underline{\hspace{2cm}}\%$$