Energy Trust Shade Effect Evaluation Form	70° г																	
	,0	(c) Univ. of	Oregon	SRML						12h				Estin	mated	annua	l AC out	_ ov
Job Name:		Sponsor: Ene	ergy Tr	ust			11h	2.	7	1	1.6	13h		0.64	kWh/	Watt DO	per yea	r
Contractor:		Lat: 44.92; Lo (Solar) time				.\$						$\bigvee$	<b>4</b>					
Date:	60°	Tilt: 75; Aspe		0		<u> 7</u> 3 (	3/		7	1	6		12					
Array Tilt:	-	Salem, OR			10h	/ /	3	\		-1	~ <i> </i>	W		\14h				
Array Orientation:					$\Lambda$	\/\	3.7	$\setminus$			_	1 1	7 🗸	$\wedge$				
Zip Code of Site:							J.,	1			1	1.1						_
	0				/3.9/		133					Tigo .	/	1.1				
The sun path chart to the right is for a solar electric	50°			9h /	+		Mot		2.3	1.2	$\neg \vdash$	25	$\forall$	$+ \setminus $	15h			_
system located in Salem, Oregon tilted 75 degrees with a 90 degree azimuthal orientation. The annual				911	/ 3.9	• <b>/</b>	3.4					0.8	1	∮ ∖	$\lambda_{1211}$			
				-//	$\leftarrow$	$\overline{}$						0.0	+	+	+			_
AC output for a system with these characteristics is	я			8.9		/	\				10	/	' \	\	\o.d			
about 0.64 kWh/Watt DC per year.	uoit 40°			<i>[</i> ]	$ \!$	3.7	10	, pr	1.6	0.8	1 %	2	0.7	-	+			_
1 7	رم <u> </u>		8h /	/ / 4.1	A = A = A = A = A = A = A = A = A = A =	9.1	$A \cap$	1 1	1.0	0.0		Les X	0.7	/\ c	).†	16h		
For comparison, annual production capacity per	Eller		/`	$\bigvee$	$/ \downarrow$	/		2.5			0.	7 /	\		$\perp X$	$\bigvee$		_
Watt of an optimally oriented system (32 degree tilt			1/	$' \setminus  _{/}$	/  \	$\setminus / \mid$		~ v)			10c/ .			/  \	$\langle   / \rangle$	, N		
and 189 degree azimuth) is 1.14 kWh/Watt DC per	g 30°		<b>∄</b> .6∕	$-$ \/	3.8	$\bigvee$	~ \ <	20°			165	1	$\perp V$	0.4	$\backslash /$	P.3		
year.	Solar 000		//_	$_{\alpha}$ $^{\lambda}$	,	$\wedge$ 1	' V		0.9	0.6		$\mathcal{M}^{0}$	0.5	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	$\bigwedge_{0.4}$	1 \ \	1	
	01	71	$n \left  \left  \right  \right  3.$	6 / /	/	\		1.3			0.4		/		/ \ "	$\frac{1}{2} \left  \left  \right  \right  $	n	
Local Production Capacity = 1.14 kWh/Watt DC			7 X 🗆	7				3217	0.9	0.2	O					$\bot X \setminus$		
per year.	0	·   /	$\sqrt{2}$	32	V Þ	.6 📈	1.2	11			0.2	0.2	$\mathcal{N}$ 0	.2 V	\	\ \psi_\)		
At Salem, a system oriented as in the sun path chart to the right will produce 56% of the annual electricity produced by an optimally oriented system.	20° - - - 10° -		<i>'</i> / X	3.2	$\Lambda$	/	$-\lambda$			7	\(\frac{0.2}{2}\)	5	$/ \setminus$	$\perp \wedge$	0.1	$\bigvee$	$\forall$	_
		6h / /	/ <sub>2.7</sub> /\	\ /	$' \setminus  $	/ \	12	Voec			``&\			/ \	$\backslash$	\ \ \	\ 18h	
		- /\/		$\setminus$ $/$	$\overline{}$	1.0	11.2					$\setminus$	$\longrightarrow$	1/	+	+	$\mathbb{Y}\setminus$	_
		.   /_/ \	. / 🗀	$- \setminus / $ :	1.8 X	X	<b>\</b>					$  \setminus  $		Χ		$ \cdot $	$\langle   \rangle  $	
		1.5/	1.8	$-\lambda$	-/		<i>Y</i>					X		H	$+\lambda$	+	$+ \setminus +$	_
		5h //	ΧI	$/ \vee$		\							$\setminus \setminus$		/ \		\\15	h
		1.1	$\leftarrow$	$/\!\!\!\!-\!$	/ 0.4	X/							$+$ \ $\times$	+	$\wedge$	+/-	$+$ $\vee$	_
Draw the horizon on the sun path chart and shade				$\left  \begin{array}{c} 0.5 \end{array} \right  \right\rangle$	( /	/							\ \ \ \	\ \ X	(  '	$\backslash  /$	$\backslash \backslash $	
obstructed areas. To calculate the percent reduction		/	<u> Y</u>	/										$\Lambda \cdot \Lambda$	\	<u> </u>	$\Lambda / \Lambda$	1
due to shading, enter the percentage of system		60°	90°	)	120		150		18	-		.00		40°	2	70°	300	)°
power output shown on the sun path chart for areas						Ea	st <-	- So	lar A	zimut	th	-> W e	est					
shaded by obstructions into the table on the right.		Period/Hr	5-6	6-7	7.0	8-9	0.10	10 11	11 12	12-13	12 14	14 15	15 16	16 17	17 10	10 10	Period/H	(
			3-6	0-/	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	13-10	10-1/	1/-18	18-19		
For example, assume the percentage of system power output from 7:00 to 8:00 between September 22 and October 21 is 0.4%, and 50% of that period		May-Jun															Jun-Jul	
		Apr-May															Jul-Aug	
		Mar-Apr															Aug-Sep	
is shaded. Enter 0.2% in the column under 7-8 and		Feb-Mar															Sep-Oct	į

Oct-Nov

Nov-Dec

Sum of

Hourly

Shading

Jan-Feb

Dec-Jan

Sum of

Hourly

Shading

power output from 7:00 to 8:00 between September 22 and October 21 is 0.4%, and 50% of that period is shaded. Enter 0.2% in the column under 7-8 and the row labeled Feb-Mar on one side and Sep-Oct on the other. Enter zero for each box where there is no shading. Note that hours are in solar time.

Sum the shading values in each column and enter the total in the bottom row. Sum the bottom row to determine the percent annual shading.

Percent Annual Shading: