Energy Trust Shade Effect Evaluation Form	70° ⊢															
	-	(c) Univ. of (Oregon SRM	L					12h				Esti	mated	annua	l AC outpu
Job Name:	_	Sponsor: Ene	rgy Trust			11h	1.1	9		2.6	13h					per year
Contractor:	-	Lat: 45.6; Lor (Solar) time			4	25					\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	2				
Date:	60°	Tilt: 75; Aspe			× × ×	2				L Y	2	X				
Array Tilt:	-	Portland, OR		10h	/]	Z ()		2.0	2.	8 /	\(\psi\)		 .14h			
Array Orientation:	_			1011	1	8 ³					2.1	} \/	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			
Zip Code of Site:					\wedge	1.1	1			1	3.4					
	50°			0.8		J. P	,	_		'	120	/	3.4			
The sun path chart to the right is for a solar electric	30 -		9h	//		KQ.		2.0	2.5		25		$\top \setminus \prime$	\15h		
system located in Portland, Oregon tilted 75	_		1	(0.	8 /	1.2					3.1	$\sqrt{_3}$.6			
degrees with a 240 degree azimuthal orientation.	-			\wedge							1					
The annual AC output for a system with these	H 0 100		/o.8 _/		/		60			130	/	`	\setminus	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		
characteristics is about 0.8 kWh/Watt DC per year.	:jg 40°		8h //	X	0.6	1/20	5	1.9	2.6	10	2	3.3	X	.7	\16h	
For comparison, annual production capacity per	Elevation 004			0.6		X^{γ}	11						//			
Watt of an optimally oriented system (32 degree tilt			-/				2			2.1	8 /			$\top \wedge$		
and 190 degree azimuth) is 1.08 kWh/Watt DC per	r 000		ø.5/\	/	\backslash / \mid		(60)			Oct 2		$ \setminus $			k 4	
year.	Solar -		//	0.4	X).5		1.5	1.9		2	.7	3.1	X	1/	
	<i>σ</i> 2	71	$1 \left\langle \right\rangle 0.3 \left\langle \right\rangle$	\backslash	/ \	X	0.9			2.1			\setminus	/\ 3.i	$ \left\langle \right\rangle $	h
<i>Local Production Capacity</i> = 1.08 kWh/Watt DC	-		/ X			/ \	25	0.9	10	VOL				\top	$\top X \setminus$	
per year.	220		// \	$ \bigvee $	1.2 V	0.3	32.5°	0.9	1.3	13	18	V г	.3 \	\ \	<i>[.s/</i> \ .	{
At Partland a gustam ariented as in the sun noth	20°		$\sqrt{}$	\wedge	/	1	/ 0.5 /s		1	2.3	1.0		$\perp \wedge$	- 2.4 -	$X \setminus$	\
At Portland, a system oriented as in the sun path chart to the right will produce 74% of the annual	_	6h /	′ <i> </i> /\	/ \	/ \		Sec "			(2°)				\	/\ 2.2 \	λ^{18h}
electricity produced by an optimally oriented	-	/ X			/	$\bigvee /$, ,			, ,	1.1	1.1	V/			X \
system.	4.00	//\	(/ V	X	/	$\langle \cdot \rangle$						1.1	1.4		$\bot \setminus \angle$	\\1.\\
	10°		\bigvee \bigwedge	/ /		/					1			$\top \wedge \top$	1.2	+//-
		5h //	/\	/ /	$\bigvee /$							\\\\\			\perp / \setminus	$1.0 \setminus \lambda^{19h}$
	-	/ X /		\bigvee	$\Lambda/$							//	0.4	/		$\langle X \rangle$
Draw the horizon on the sun path chart and shade	-	. //.\./		Λ . λ	/ <u>/</u>							\ \ \	\	\$.0	V	
obstructed areas. To calculate the percent reduction		60°	90°	120)0	150	00	180	00	21	.00	2.	40°	2	2700	3009
due to shading, enter the percentage of system						st <-	So	lar Az	zimut							
power output shown on the sun path chart for areas shaded by obstructions into the table on the right.		Period/Hr 5-6 6-7 7-8 8-9 9-10 10-11 11-12 12-13 13-14 14-15 15-16 16-17 17-18 18-19 Period/Hr														
shaded by obstructions into the table on the fight.		Period/Hr	5-6 6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	Period/Hr
For example, assume the percentage of system		May-Jun														Jun-Jul
power output from 7:00 to 8:00 between September		Apr-May														Jul-Aug
22 and October 21 is 0.4%, and 50% of that period		Mar-Apr														Aug-Sep
is shaded. Enter 0.2% in the column under 7-8 and		Feb-Mar														Sep-Oct
the row labeled Feb-Mar on one side and Sep-Oct		Jan-Feb														Oct-Nov
on the other. Enter zero for each box where there is		Dec-Jan														Nov-Dec

Sum of

Hourly

Shading

Sum of

Hourly

Shading

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.

no shading. Note that hours are in solar time.

Percent Annual Shading: