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	2.	8			19h					per year
Contractor:	-	Lat: 46.15; Lo (Solar) time				11h	~.				7 ¹³ b	,				
Date:	60°	Tilt: 45; Aspe			Ŋ,							8				
Array Tilt:	00	Astoria, OR		10h		9/2	\	2.5	3.	0 /] \	14 h			
Array Orientation:	_			101	$\langle \ / \ $	Pos				/	` 'c'	$\langle \ / \ \rangle$	V ⁴ n			
Zip Code of Site:	_				X	1.8				1	3.7	$\top X$				
	500			/1.2/	$' \setminus $	1	5						3.6			
The sun path chart to the right is for a solar electric	50°		9h	//		K2,		2.2	2.9		2000			\15h		
system located in Astoria, Oregon tilted 45 degrees			911	\mathbb{Z}	1	1.5						Х з	.7 \			
with a 270 degree azimuthal orientation. The	-			X		1.3					3.4		+			
annual AC output for a system with these	ation 40°		/1.0,	/ \	/					1	/	\		3.2		
characteristics is about 0.8 kWh/Watt DC per year.	:5 40° ⊢		-+//	$\overline{}$	0.9		(SP)	1.0		100		3.3	\bigvee	+		
	649		8 h	9.9	0.0	χ_{ϕ_0}		1.6	2.0		Les X	3.3	/\ 3	L\$ \	\16h	
For comparison, annual production capacity per	Eleva		-/X				1.0			 2.	2 /	\leftarrow	\wedge	$+$ \times	\forall	
Watt of an optimally oriented system (34 degree tilt and 191 degree azimuth) is 1.03 kWh/Watt DC per	<u></u>			/	\setminus / \mid	1	2			Locx		$ \setminus $	'	\langle / \rangle	le la	
year.	Solar -		-///	0.7	\rightarrow).6		4.4		1	$\int _{\mathbb{R}}$	\downarrow	2.9	\bigvee	$\forall -$	
year.	νχ	71	1 / 0.5 /	\	$/ \setminus 1$			1.1	1.4		N ~	† /\		1 2.8	3 \ \ \ 17	h
Local Production Capacity = 1.03 kWh/Watt DC per year.			/X		\rightarrow	$\overline{}$	0.7			1.8	+	+/-		+	+X-	
	_		///		. \	/	75.57	0.7	0.9	10p	\	\	$ \cdot $		$/ / \rangle$	
	20° -		.2/ \/ 0.2	X).3	0.3	% 0.3		$\overline{}$	1.2	1.5	1	.6 X	2.2	V 7.0	
At Astoria, a system oriented as in the sun path	-	6h /	/ <u> </u>	$ / \rangle $	/		(10						\parallel / \setminus		N 2.0 \	\
chart to the right will produce 78% of the annual	_	\longrightarrow \bigvee	$-/\!\!\!\!/$		/		Dec			13	0.9	\longrightarrow	$+\!\!\!/-$	\setminus	-	\bigvee
electricity produced by an optimally oriented		//\	$ \cdot $	1 V	/	χ					0.5	0.9	\mathbb{V}_{-1}	\setminus	\ ,	$\Lambda \Lambda = 1$
system.	10° –		\	Λ	-	\bigvee					\perp	<u> </u>	1.1	· X	1.0 \ /	4.9
	-	5h //	$X \mid / \setminus$		\	/					\	6.0	$/ \setminus$	/\	X	$0.9 \setminus 19h$
	_	$\longrightarrow \bigvee \bigcup$	<u> </u>	$\setminus \bot$	VA							$\Lambda \lambda$	\perp	/	\perp / \setminus	
	-				$/ \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \!$							$ \bigvee \rangle$	0.3	($\setminus /$	
Draw the horizon on the sun path chart and shade obstructed areas. To calculate the percent reduction			<u>, , V , , , </u>	\triangle								\	\	0.2	¥	1 / 1
due to shading, enter the percentage of system		60°	90°	120) ⁰	150	0°	180	0°	21	L0°	2	40°	2	270°	300°
power output shown on the sun path chart for areas		East < Solar Azimuth> West														
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														
		May-Jun	3-0 0-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-13	13-10	10-1/	1/-18	16-19	Jun-Jul
For example, assume the percentage of system																
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: