OREGON DEPARTMENT OF ENERGY SOLAR INCOME CALCULATION INSTRUCTIONS

GENERAL INFORMATION

These instructions are to be used only in conjunction with the Business Energy Tax Credit Form (BETC). Follow appropriate instructions, print out completed form and attach it to the Application for Preliminary Certification.

This form and calculation are property of the State of Oregon and shall only be used in conjunction with application of the Business Energy Tax Credit.

All spaces in **yellow** require inputs. **Shaded** spaces are calculated by the spreadsheet.

REQUIRED INPUTS

STEP 1: List Proposed Building:

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1. List the building name in the proposed building cell.

STEP 2: Select City:

1. Select one of the nine cities from the pull down menu on the spreadsheet. Select the city closest to the project location or the most similar in climate (for example a building being built in Burns would select Pendleton, a project in Bandon would select North Bend).

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STEP 3: Input Building Areas

1. Input the buildings roof, gross facade (including glazing), and glazing areas. All dimensions should be given in Square Feet. For uniquely shaped buildings or roofs and walls with slopes or unique angles, average out facades and input average wall area. Roofs with a slope greater than 30 degrees shall be input as a tilt up wall. Roofs with a slope of 30 degrees or less shall be input as a flat roof.

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STEP 4: Input Building Shading Percentage.

1. Either of the following options can be used to calculate the amount of shading for the proposed building. Select either Option 1 or Option 2

Option 1: Use a building modeling or load software program to calculate the total amount of shading for each façade or a total overall building shading percentage. Provide sufficient backup from the software program for shading inputs.

- a. Input the shading percentage for each wall and facade into the wall's corresponding Shading Percentage Cell or input the overall shading for the entire building.
- b. If the overall shading is input make sure the individual façade inputs are blank or 0. If individual facades are input make sure the overall shading is 0.
- c. For example, a DOE2 building model can be modeled with shading from objects surrounding the building and modeled without. The shading percentage is found by comparing the solar gain difference between the two models. This can be found in the "building cooling load from wall conduction" hourly report in DOE2. This percentage difference can be input into the shading percentage cell.
- d. Skip ahead to Step 5.

Software Façade Shading Input:

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Option 2: Input the building shading percentage by using a solar graph. a. Refer to instructions for Option 2: Solar Graph Shading.

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28 147,569 thems Footnotes:	
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The building is a net producer or energy and may be able to sen back	
32 Annual Converted Energy by PV System 0 kWh 2. Building Energy Use is total building energy use converted to three	
33 Annual Converted Energy by PV covered Roof 0 kWh forms of common energy units.	
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STEP 5: Input PV Efficiency
1. Input the overall efficiency of the building photovoltaic system. If you are unsure what this efficiency is, input 10%.

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6	_						Natural Gas Energy Usage	0	therms	
7 City (Select most applicable)	Port	and -				Solar Energy	#2 Fuel Oil Energy Usage	0	gallons	
8 Weather Data Used (Selected From Chart Above	Por	tland		0		MWH	Other Energy Source	0	kBtu	
10	Total Area	Glazing Area	_	Percentage	January	136.2	Total Building Floor Area	0	sqπ	
11 Roof Area	21,280	0	sqft	4.8%	February	188.5	Building Energy Use Index (EUI)	#DIV/0!	kBtu/Sq.Ft./year	r
12 N Wall Area	6,270	946	sqft	0.0%	March	318.3		1050 (151		
13 NW Wall Area 14 W Wall Area	11 260	1 300	sq ft	6.0%	April	418.7	Building Energy Use	#DIV/0!	kWh therme	
15 SW Wall Area	11,200	1,000	saft	0.070	June	575.2		#DIV/0!	kBtu/vear	
16 S Wall Area	6,270	1,018	sqft	35.0%	July	635.3			ĺ.	
17 SE Wall Area	44.000	4.000	sqft	4.0%	August	552.5	Total annual incoming solar	#DIV/0!		
19 NE Wall Area	11,260	1,930	sq π sq ft	1.0%	October	420.8	Converted solar energy usage	#DIV/DI		
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21	Overall Shad	ing Percentag	le	0.0%	December	116.5	Converted solar energy as a %	#DIV/0!		
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32 Annual Converted Energy by PV System	432,500	kWh					 Building Energy Use is total building 	ulding energ	v use converted to	o three
33 Annual Converted Energy by PV covered Roof	253,139	kWh					forms of common energy units	3. 3.		
34										
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37 Annual amount of Water that falls on the roof.	542,829	gallons								
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BUILDING ENERGY USE INPUTS

STEP 7: Input building energy use.

- 1. Input the buildings annual energy usage index. To obtain this follow the steps below.
 - a. Input the total annual energy usage of the building, in kWh, therms, gallons of fuel oil, or other form of energy in kBtu. If the building is an existing building, derive energy usage from current utility bills. If the building is a proposed building and has not been built yet, the energy usage can be provided from an energy model (DOE2, etc.).

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3	Building Solar Energy Budget Inputs								Building Energy Use Inp	uts			
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5	Proposed Building	Eco	trust				Annual S	olar Budget	Electricity Annual Usage	985,539	kWh		
6									Natural Gas Energy Usage	8,674	therms		
7	City (Select most applicable)	Port	land –					Solar Energy	#2 Fuel Oil Energy Usage	0	gallons		
8	Weather Data Used (Selected From Chart Above	Por	tland	1				MWH	Other Energy Source	0	kBtu		
9			Las		Shading				Total Building Floor Area	0	sqft		
10	Deaf Area	Total Area	Glazing Area	A	Percentage	Ja	anuary	136.2	Building Engenu Ling Jaday (EUI)	400.001	LOW C - Ft have		
12	N Wall Area	6 270	946	sqii	4.0 %	r M	eoruary Aarch	318.3	Building Energy Ose Index (EOI)	#DIV/U	KDIU/Sq.FI./year		
13	NW Wall Area	0,210	1 040	sqft	0.070	Ă	spril	418.7	Building Energy Use	#DIV/0!	kWh		
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15	SW Wall Area	0.070	4.040	sqft	25.004	Ju	une	575.2		#DIV/0!	kBtu/year		
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19	NE Wall Area			sqft		ō	October	280.2	Converted solar energy as a %	#DIV/01			
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25	 Provide Attached Solar Percentage Calculation S 	Sheet							Converted roof solar energy	26%			
26	Annual Incoming Color Energy	4 225 000	1486						as a % of building electricity usag	e			
28	Annual incoming Solar Energy	147 569	therms						Footpotes:				
29		14,756,901	kBtu						1. When the percentage of conve	rted solar ex	ceeds a hundred pe	rcent,	
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STEP 8: Input Building Floor Area

- 1. Input the total building floor area. Dimensions should be given in Square Feet.
- 2. Once this has been input, the spreadsheet will calculate the buildings Energy Use Index (EUI) as well as total energy usage in kWh, therms and kBtu/year. The spreadsheet will then calculate the amount of the building's energy usage that can be provided by the sun with and without a PV system.

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6							_	Natural Gas Energy Usage	8,674	therms	
7	City (Select most applicable)	Port	land –				Solar Energy	#2 Fuel Oil Energy Usage	0	gallons	
8	Weather Data Used (Selected From Chart Above	Por	tland				MWH	Other Energy Source	0	ЌВtu	1
9					Shading			Total Building Floor Area	64,964	sqft	Ŧ.
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13	NW Wall Area	0,270		saft	0.070	April	418.7	Building Energy Use	1.239.759	kWh	÷ .
14	W Wall Area	11,260	1,300	sqft	6.0%	May	529.5		42,301	therms	t I
15	SW Wall Area			sqft		June	575.2		4,230,059	kBtu/year	
16	S Wall Area	6,270	1,018	sqft	35.0%	July	635.3	Tetal annual incoming color	2409/		+ -
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26	-							as a % of building electricity usag	je		
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31	PV System Efficiency	10.0%	Efficiency					excess energy.			+
32	Annual Converted Energy by PV System	432,500	kWh					Building Energy Use is total bit	uilding energ	y use converted to three	T.
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STEP 9: Attach the completed calculation to your BETC Application