



Copyright 2013
TheSolarPlanner.com

Energy Management Service

Ver. 1 PV System Cost, Payback Time & Profit Projections

Enter proposed array size in kilowatts:		4.00k		<i>Range is from 1 to 10 (e.g. 4.5)</i>	
Check one:	<input checked="" type="checkbox"/> STC/DC watts	<input type="checkbox"/> CEC/AC			
<i>STC/DC is the most common watt type used in calculations.</i>					
Item	Initial Costs				Total
System Purchase and Installation:		<i>Enter data for one option only.</i>			
Option 1: Quoted Price					
Option 2: Dollars Per Watt Estimate	Click Resources tab below for help.				
System Size (watts)	4,000	Dollars per Watt (eg. 4.00)	\$4.50		\$18,000
Option 3: Budget Method					
<i>Click Itemized Budget worksheet tab below for help calculating a value.</i>					
Additional Expenses		<i>Complete all sections that apply to your project.</i>			
Roof Repair or Enhancements					
Other Home Repair or Improvements					
Loan Fees (if any) <i>Name each loan and amount (left columns) and upfront fees (right column).</i>					
Loan 1:	FHA	Loan Amount	\$10,000	Online Loan Calculator	\$100.00
Loan 2:					
Loan 3:					
<i>"Upfront fees" includes all the loan's related costs (e.g. required energy audit, application fee, etc.) that will be paid for immediately. DO NOT include the loan amount or interest under the Total column. (Loan interest is accounted for on the next page.)</i>					
Homeowner's Insurance Added Cost -Initial Payment (if any)					
Other Initial Expenses:		<i>Identify each item (left column) and its cost (right column).</i>			
Scroll down to Page 2.		Total Initial Costs:			\$18,100

Page 2		Cost/Payback/Profit Worksheet		
Item	Future Costs			Total
Loan Interest				
Total interest to be paid on all loans				\$700.00
<i>Enter the total interest charged. Do not include the loan amount or upfront fees. If you expect to pay off a loan sooner than its full term, enter the total adjusted actual interest you expect to pay. Penalty fees, if any, can also be included.</i>				
Cost of Inverter Replacement in 10 yrs.				\$1,850.00
<i>Skip this item if using microinverters. The inverter's cost should be the same as the first inverter (or sum of string inverters). The cost typically ranges from \$1,200 to \$2,500.</i>				
Other one-time and non-annual costs		Number of years (over 19 yrs.) this cost will occur:		
<i>Cannot take place in 1st year.</i>	Cost	Do not include loan interest here.	5	
inspection	\$100			
Total One-Time & Non-Annual Costs				\$3,050.00
Annual Future Costs				
Array Maintenance and Cleaning				\$75.00
Annual Property Tax Added (if applicable)				
Annual Added Insurance cost (if applicable)				
Other Annual Expenses:	<i>List each item and its yearly cost.</i>			
Annual Miscellaneous Expense				
Total Annual Costs			<i>Will be added to each cost year.</i>	\$75.00
Total of Initial and Future Costs of PV System				
<i>Non-initial costs accrue beginning with Year 2. Inverter replacement kicks in Year 10. NOTE: These totals don't factor in tax credits or rebates.</i>	1st Year (initial costs)		\$18,100.00	Scroll down to Page 3.
	Approx. Cost for 5 yrs		\$18,652.63	
	Approx. Cost for 10 yrs		\$21,193.42	
	Approx. Cost for 20 yrs		\$22,575.00	

Payback and Profit Estimates

Item				Total
PV Incentives, Credits & Rebates, Home Improvements & Conservation				
Federal 30% Income Tax Credit				\$5,400
\$18,000.00	X	30%		
State Income Tax Credit (if applicable)			STC	
State/Utility Rebate #1 (if applicable)				
State/Utility Rebate #2				
Other PV-specific money incentives:	<i>List each item and its total payout.</i>			
<i>Property tax and sales tax exemptions don't need to be listed here, since no direct income is generated from these benefits.</i>				
Energy Efficiency Rebates	<i>List any HVAC, appliance, light bulb, solar heater or other rebate item and the total rebate you expect to earn.</i>			
new refrigerator				\$50.00
CFL light bulb replacements				\$15.00
Other Incentive Reimbursements, Payments or Rebates				
Estimated Annual Utility Savings from Conservation/Improvements				\$100.00
Total				\$5,500.00
<i>To estimate conservation savings, use our Energy Savings worksheet or other energy audit. Be sure to multiply any saved kilowatt hours by your baseline rate only.</i>				Scroll down for Page 4

Avoided Utility Charges		Cost/Payback/Profit Worksheet - Page 4 of 6				
Utility Bill Kilowatt Hour (kWH) Usage				Payback and Profit		
Enter total kilowatt hours consumed in past year:				10,434	Check your bills.	
Anticipated Grid Offset		Complete one option below only.				
Option 1: Quoted Offset			Range is from 10 to 105%.			
Sales quote must be based on the PV array size entered on Page 1.						
Option 2: Calculated Offset		For help, click the Resources tab.				
Size of proposed PV array		4.00k		Derate factor		0.77
Average Daily Sun Hours		5.27	Look up	Leave Sun Hours box blank if using Option 1.		
Annual PV kWh estimate		5925		Grid Offset		56.8%
Rates		Select your utility rate structure below.				
Tiered Rates		<input checked="" type="checkbox"/>	Time of Use (TOU) rates		<input type="checkbox"/>	
Enter rate details:		Complete one half of table only.			Use Left Half	
Tier Type	Rate	%	% values must total 100	TOU Type	Rate	%
Baseline	0.159	65		Normal rate		
Tier 2	0.28	15		Peak (highest)		
Tier 3	0.41	20		Late Night (lowest)		
Tiers 4+	0	0		4th + rates (if any)		
Click Resources tab for help. Numbers in % column reflect the portion of your annual utility charges billed at that rate and must add up to 100 (e.g. 55, 10, 30, 5). Enter zero in unused boxes. Enter rates as decimals (e.g. .15). To gather info for this table, click the Utility Rates worksheet tab below and complete it for your last 12 bills.						
Estimated Annual Savings (1st year)				Rate Type Used		TIER
Tier Type	Savings	Total Savings		TOU Type	Savings	
Baseline	\$361.35			Normal rate		
Tier 2	\$438.23			Peak (highest)		
Tier 3	\$855.59			Late Night (lowest)		
Tiers 4+	\$0.00			\$1,655.16	4th rate (if any)	
Utility bill savings exclude monthly fees, taxes and surcharges. Scroll right to see computation tables. Verify the quoted offset is correct for the system size, if using Option 1 - Anticipated Grid Offset.					Scroll down to Page 5.	

Payback and Profit (Cont.)		Cost/Payback/Profit Worksheet - Page 5 of 6			
Market Value of System		<i>Use one option below only.</i>			
PV Array Size	4000w	Type of Watts	STC		
The array size was entered on Page 1. For example, a 4k system would equal 4,000 watts. A 6.5k system would equal 6,500 watts.					
Option 1: Dollars Per Watt Estimate		<i>PV efficiency loss is factored in (see next section), plus a depreciation of 50% at 10 years and 80% at 20 years.</i>			
<i>Click on Resources tab for help determining the resale rate for your area.</i>	If sold in:				
	5 yrs.		10 yrs.		20 yrs.
Watt resale rate (e.g. 2.00)	\$2.00	\$7,600.00	\$3,420.00	\$547.20	
Option 2: Arbitrary Value					
<i>Enter a value of your choice for each time frame.</i>					
Multi-Year Adjustments					
Percentage of rate increases expected annually		2.00%	<i>Default = 2</i>		
Percentage of PV efficiency loss annually		1.00%	<i>Default = 1</i>		
<i>Due to the complexities in calculating it for many different time periods, the Discount Rate isn't considered in this worksheet. However, it's a staple of investment planning, so expect to see it in sales proposals prepared by solar companies. Generally, the present value of money is assumed to be greater than its value in the future by a certain percentage.</i>					
Referral Commissions		New PV system owners sometimes earn a commission of \$100 or more by referring friends and neighbors to the same contractor.			
Commission per customer:	\$200				
# of referrals anticipated:	1		Total	\$200.00	
Ten-Year Income Projection					
PV Incentives, Credits & Rebates		\$5,500.00		Scroll down to Page 6.	
Avoided Utility Charges		\$18,800.37			
Referral Commissions		\$200.00			
System Resale Value (10-years-old)		\$3,420.00			
Total		\$27,920.37			

20-Year Simple Cash Flow Projection

Year	Costs	Income		Cumulative Balance (Profit/Loss)
		Tax Credits, Rebates, Commissions, Incentives, Resale*****	Bill Savings*	
1**	\$18,100	\$5,500	\$1,755	-\$10,845
2***	\$138		\$1,782	-\$9,201
3	\$138		\$1,809	-\$7,530
4	\$138		\$1,836	-\$5,832
5	\$138		\$1,864	-\$4,106
6	\$138		\$1,893	-\$2,352
7	\$138		\$1,921	-\$569
8	\$138		\$1,950	\$1,243
9	\$138		\$1,980	\$3,085
10****	\$1,988		\$2,010	\$3,107
11	\$138		\$2,040	\$5,009
12	\$138		\$2,071	\$6,942
13	\$138		\$2,103	\$8,907
14	\$138		\$2,135	\$10,903
15	\$138		\$2,167	\$12,932
16	\$138		\$2,200	\$14,993
17	\$138		\$2,233	\$17,088
18	\$138		\$2,267	\$19,217
19	\$138		\$2,301	\$21,379
20	\$138	\$547	\$2,336	\$24,124
Totals:	\$22,575	\$6,047	\$40,652	

*Notes: *Bill Savings takes into account the annual utility rate increase listed in "Multi-Year Adjustments", and the system efficiency loss rate. **Only Initial Costs are included in Year 1. ***Most future costs (including interest) are dispersed evenly across Years 2-20 and may not reflect actual year-to-year expenses. ****Inverter replacement, if any, occurs in Year 10. ***** Resale of the system is assumed in Year 20.*

Payback Time Estimate	8 years	Date Completed:
Net Profit After 20 years	\$24,124	1/21/14

Do not enter data or attempt to delete anything on this page

Rate Computations				kWh saved	5925
		Rate Type Used	TIER		
Tier	Before PV	Hours	Cost after PV	New Hours	Balance
Baseline	\$1,078.35	6782.1	\$717.01	4509	0
Tier 2	\$438.23	1565.1	\$0.00	0	2273
Tier 3	\$855.59	2086.8	\$0.00	0	3838
Tiers 4+	\$0.00	0	\$0.00	0	5925
Total	\$2,372.17	10434	\$717.01	4509	

NOTE: Order of kWh allocation is Tier 4+, Tier 3, Tier 2, Base rate.

TOU	Before PV	Hours	Cost after PV	New Hours	Balance
Normal					
Peak					
Late Night					
4+					
Total	\$0.00	0	\$0.00	0	

NOTE: Order of kWh allocation is Peak, Normal, 4+, Late Night.