



Even thou the concept of solar electric is simple.
Photovoltaic(PV) energy is still a science with allot of calculations, and consumers with allot of questions.
TPVS1.0 helps with the calculations that answer the questions.

If the homeowner, has a tool to design and compare pricing and benefit at their fingertips.

More of your desires in the design, you just may build it.

1. [About TPVS and Products](#)
2. [User & PC requirements, Installation](#)
3. [Navigating the Forms](#)
4. [Quick Start Guide](#)
5. [De-Rating the system design](#)
6. [Update Module & Inverter Pricing](#)
7. [Reports](#)
8. [Website, help & support](#)

DISCLAMER,

Subject to EULA, TPVS is licensed to use the application for personal educational use.

Results do not constitute an offer to sell or install a PV system.

BOS Estimate is a percentage of module/inverter costs. Your actual costs and benefit will vary based on your location and market forces.

Only qualified individuals should design and install safe BOS.

NO WARRENTY OF ACCURACY OR FITNESS FOR ANY PARTICULAR PURPOSE.

TPVS ASSUMES NO LIABILITY FOR PROGRAM RESULTS OR YOUR USE OF INFORMATION. PROGRAM IS PROVIDED “AS-IS” WITH

ALL FAULTS KNOW OR UNKNOWN, USE AT YOUR OWN RISK.

USERS ARE ADVISED TO SEEK QUALIFIED COMPANYS TO PERFORM SERVICE ON OR TO PHOTOVOLTAIC SYSTEMS.

PHOTOVOLTAIC SYSTEMS ARE ELECTRICAL GENERATION SYSTEMS, DANGER HIGH VOLTAGE, SERIOUS INJURY OR DEATH CAN OCCUR TO UNQUALIFIED PERSONS SERVICING.

About TPVS

TURBO PV SOLAR, LLC. (TPVS)

TPVS is committed to help the reduction of soft-costs for residential Photovoltaic (PV) systems. By providing an easy to use application, to help installers quickly provide sizing, pricing and benefit analysis of their products. Or the DIY to compare modules and inverters they can obtain pricing for. We hope that more consumers will recognize the benefit of PV, but we also recognize not all will be scholars of PV mathematics.

TPVS is a relational database application to marry the various data required to quickly size and performance analysis small residential PV systems. This is where we feel our tools will be of use, giving the installer/client education on, and a dialog of the proposed system. User's can change parameters of size, placement, components, incentives and rebates to quickly perform the calculations. Allowing the expert or novice designer to quickly assess the viability of PV under market conditions for the proposed system.

With more of your desires in the design, you just may build it.

TPVS applications run on the Msft Access 2010 platform

You must have Access 2010 installed or install the free runtime (reader) program.

We use Access Msft to enable you to leverage a database application and keep development cost low, passing these savings to you.

TPVS Designer 1.1

TPVS Designer v1.1 helps the user quickly calculate photovoltaic (PV) system essentials.

Such as system size for desired electrical offset. Will it fit the defined space and how much you may expect to benefit.

Unlike the other programs that help initially size, then you have to select modules and inverters from a vast database.

We allow you to pre-price the modules and inverters, and give you a selection guide to build the system using actual specs of the components you have priced.

INPUT SCREENS

- Zip code
- Electrical Use & Cost
- Available space, Orientation/ Tilt, De-Rates
- Scalable unit pricing of Modules & Inverters
- Incentives / Rebates



RESULTS

- Estimate of system size and savings.
- Ability to modify system size to produce desired offset.
- Price comparison of selected parts to a per watt price, gross, net and per Kwh over time.
- Reports of, system and 20 year estimated financial analysis.
- One Line Diagram, to visualize selected components and help design balance of system.

ADDITIONAL FEATURES

- Over 900 current UL listed & CEC approved modules, including 170 + inverters.
- Ability to Add Modules & Inverters to database
- All securely on your PC, no need to have internet connection except for some informational links.
- All data is saved and retained as you enter
- Output to PDF, for email or printing.
- One time license, No high, or re-occurring subscription fee's.

USER REQUIREMENTS.

Ultimately you make the end choices in configuring your system.

We only help with the calculations and present you choices to evaluate. You should have an understanding of:

- Basic PV concepts and terminology.
- Can self-survey your site
- Ability to look up potential rebates or incentives.
- Can find online or local dealer pricing of modules and inverters.

TPVS Dwg 1.1

TPVS Dwg is a database application to quickly build a specification driven "One Line Drawing" of the selected components and interactive calculations. Quickly give your client's a picture worth a thousand words and open the discussion of BOS or benefits

- Choose from over 900 modules and 170 inverters
- Ability to add your own
- Helps Voc, Isc, Vmp, Imp calculations of specified strings. As well As array square footage and weight per sq ft.
- Save to PDF for printing or email

TPVS Dwg is include with TPVS Designer 1.1

TPVS Dwg 1.1 is a stand alone app for diagrams only, and includes NO sizing or ROI calculations.



[Back to Index](#)

Requirements & Installation

PC Requirements.

TPVS operates on the MSFT Access 2010 Runtime platform.

You must have Access 2010, or Install the FREE Runtime program prior to installing TPVS (linked below)

Supported Operating Systems: Windows 7, Windows Server 2003 R2 (32-Bit x86), Windows Server 2003 R2 x64 editions, Windows Server 2008 R2, Windows Server 2008 Service Pack 2, Windows Vista Service Pack 1, Windows XP Service Pack 3
Only the 32-bit Access 2010 Runtime is supported on Windows XP Service Pack 3.

<http://www.microsoft.com/download/en/details.aspx?displaylang=en&id=10910>

Access 2010 is not supported for MAC or Android OS

TPVS requires approximately 20mb of disc space in addition to Access Runtime versions

File Name	Size
AccessRuntime.exe	175.5 MB
AccessRuntime_X64.exe	212.4 MB

Installation.

You have the option to obtain a license for:

1. TPVS product only (you must have Access or Runtime installed prior.)
2. TPVS product + Access Runtime.exe
3. TPVS product + Access Runtime_X64.exe

You will receive a download link upon purchase of license.(please be sure to provide a valid email address)

Or download instantly with registration for Demo version.



Once you have downloaded your .msi file.

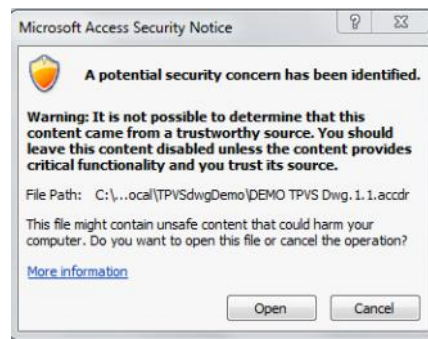
Double click the file to start installation.

Follow the screen prompts to complete installation.

Select run from the Start menu or desktop shortcut.

Upon opening the program you will be prompted by a security warning.

If you have downloaded your app from TPVS and our authorized sites click OPEN, otherwise we advise caution that you obtained your copy from an authorized distributor.



TPVS will Open to splash screen and zip code entry.

Next [Navigation](#) & [Quick Start](#) guide to program.

[Back to Index](#)

Navigation



Header Navigation Buttons

Navigation of the forms is fairly easy. Each button in the header represents a form of the program to collect various information about your systems design.

The RED outlined button is where you are in the program and you may click either **right to progress** or **left to go back** thru the forms.

As you navigate there will be additional buttons to open additional information or data forms, these will open allowing you to view or update data. Typically you must close the form after editing to proceed.

Advance Menu

This form allows you to verify incentive data or get to reports or pricing

Anticipated yearly electric rate increase	<input type="text" value="5.00%"/>	
Monthly Connection charge	<input type="text" value="\$8.00"/>	
Financial incentives		
PBI or REC value / Mw	<input type="text" value="\$25.00"/>	Term <input type="text" value="20"/> Yr's
Federal ITC	<input type="text" value="30"/>	
State rebate per W	<input type="text" value="\$0.00"/>	
Additional Upfront Rebate	<input type="text" value="\$0.00"/>	
Find Incentives & Rebates for your area www.desireusa.org/solar		
Percentage of module & inverter price to overall costs	<input type="text" value="69%"/>	

Modules & Inverters can represent a significant portion of your investment. By default 60% of a simple system, but anywhere from 40 to 70% of installed cost depending on how complicated your system is and or local labor and permitting fees. Consult a solar pro , electrician and your AHJ for more detailed costs.

Occasionally the page may miss-load. The Refresh button, helps to clear any calculation errors,

[Back to Index](#)

Quick Start

The quick start guide is to show you each screen of the program, with explanation of user entry and results as you proceed thru the program


1. Enter your zip code, and we will bring to focus the nearest weather data



The screenshot shows the 'Weather and Client Info' screen of the Turbo PV Solar program. It contains several sections: 'System Location' (ZIPCode: 19438, City: HARLEYSVILLE, Latitude: 40.27, Longitude: -75.40), 'Weather Station Location' (WBAN No: 14737, City: ALLENTOWN, State: PA, Distance miles: 26.0, Elev(m): 117, Lat(N): 40.65, Long(W): -75.43), 'Insolation & Temperature data' (Yearly Avg. KWh/m2/day: 4.4, Record Low Temp °C: -24.4, Source NREL Redbook, NEC 690.7 table VOC correction factor: 1.2, Max String VOC/STC: 500), and 'Owner Info' (First name, Last name, Address, City, State, Zip, phone, email, utilityacct, meternumber). There are also buttons for 'See More Info', 'ZIP Entry', and 'Add Site Image'. Annotations with arrows point to various elements: 'Based on zip code, locate closest NREL weather station data' points to the Weather Station Location section; 'Owner info is optional, but will not be included when printing reports or inquires if omitted.' points to the Owner Info section; 'Return to change zip code' points to the ZIP Entry button; 'Add an aerial picture of your site.' points to the Add Site Image button; and 'NEC maximum VOC calculation if module VOC Tco not provided' points to the NEC 690.7 table VOC correction factor.

2. Enter current electrical service, rates and desired savings. And we start to calculate your potential systems.

Select your utility Retail Kwh rate EIA 2008 Cost per Kwh Kwh \$
 \$0.1029 Connection charge

Avg. Electric use?
 kwh/month Avg monthly Bill \$: \$139.31 Expected Rate Increase
 Kwh year use 10800 Annual Costs \$1,671.72

Service Voltage **Max Additional Source** A
Main Panel Disconnect or OCPD Rating **OCPD to Busbar**
Main Panel Busbar Rating **NEC2008 690.64(B)(2)**
 What's this info for? **Max Inverter Output AC watts** 13440

Desired electric offset from PV 3.4 AC watts from PV per Peak Sun Hour/1000w/m2
 4.5 Est STC array size Est.Savings with PV \$691.86

Tell us who your utility is, and how much you may pay for a kwh of electricity.
 Default rate, available EIA retail rate.

Tell us how much electric you use.(Kwh/month)
 And what you may expect in annual increases

Enter existing service information
 This info will limit inverter selection, to voltage and OCPD that will fit load side.
 see help for more info

How much energy do you want to save?
 (type percentage, or use dropdown list)
 See potential System size & savings

3. Tell us more about your site. And we drill into module and inverter spec's to calculate your system choices.

Desired electric offset from PV AC watts from PV Kwh/month avg.
 Est STC array size

At this point we've collected your location and desired electric, now the size of your system will depend on available space and its orientation as well as system de-rates

1 Type of Mount

2 Orientation: Text34:
Tilt/ slope Text36:

3 System De-Rates User Defined De-rates

4 sitting length: 476 Approx Sq ft Desired Array size
 sitting width: 1120 Defined sq ft

Manufactur	Model #	# li	Mx	Mxd	Manufactur	Model	#Mx	Mxlv	M	Mir	Ma	Ma	LP	HP
solectria Ren	PVi 5000	1	2	27	REC	REC225AE-US	21	13	9	8	48	42	76%	67%
solectria Ren	PVi 5000	1	2	26	REC	REC230AE-US	21	13	8	8	48	42	76%	67%
sMa america	sb 70000Us	1	3	38	REC	REC230AE-US	21	13	11	10	48	42	76%	67%

Record: 1 of 40 No Filter Search

Electrical use & desire,
 Carry over from prior electric form

1. Type of mount will set the temp adder.
2. Orientation and tilt, will set your estimated insolation.
3. User defined De-rates can be set
4. Approximate dimensions of your mounting area will help determine what will fit.

Configuration bar, the heart of helping you design a system.

After taking into account your locations resources ,electric use ,desired savings, available space and orientation.
 We start calculating systems from our database of modules and inverters.
 What number of modules are needed? How many inverters ?
 What string combinations?
 How many will fit the space you define?

We have over 500+ common modules and 100+ inverters in the database,
 This potentially could lead to 5000+ combinations.

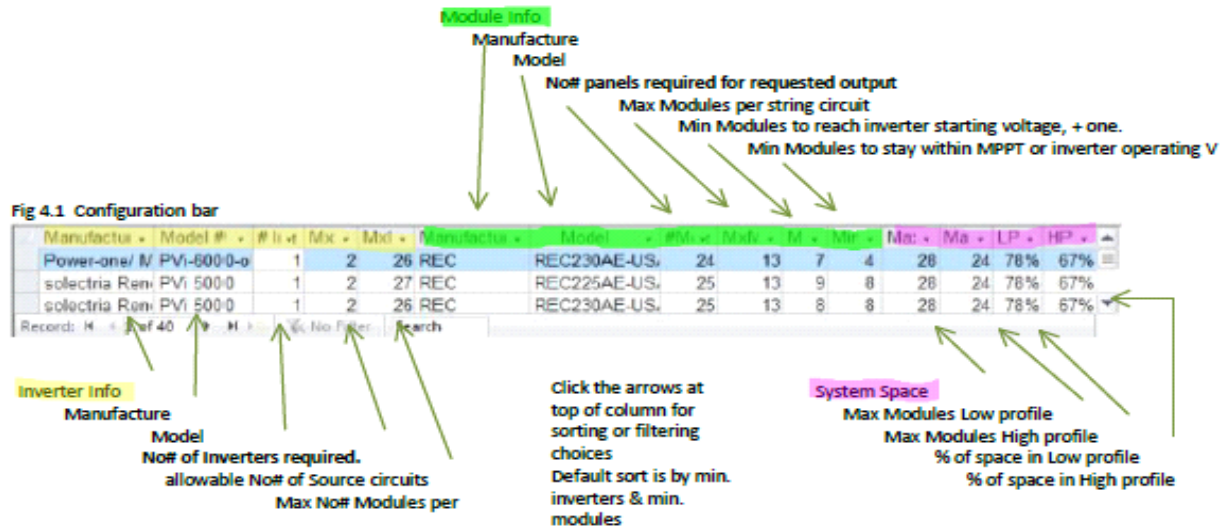
The way we help drill them down, is to include only what you can price.
 Our default pricing gets you started, but add from an installer or DIY.
 You can even add your own modules & inverters to the database.
 We provide some use full links to find this info.

3a. Configuration Bar:

here we combine the information you have so far supplied and start configuring potential systems.

The below illustrates what info we provide to help design your system.

In figure 4.1 We consolidate a lot of information to help you chose what systems may fit your interests. Understanding the layout and significance of the data helps to receive full benefit of the program



The first time you see the configuration bar, it is essentially informational. You are not choosing components , but determining what size system will fit the defined space and your desired electricity offset. Make adjustments to prior inputs of offset, space or orientation/ tilt and see immediate changes in the configuration bar

In the above example;; 1 PVI 6000 inverter, can take up to 2 stings of an REC 230w module, and max out at 26 modules

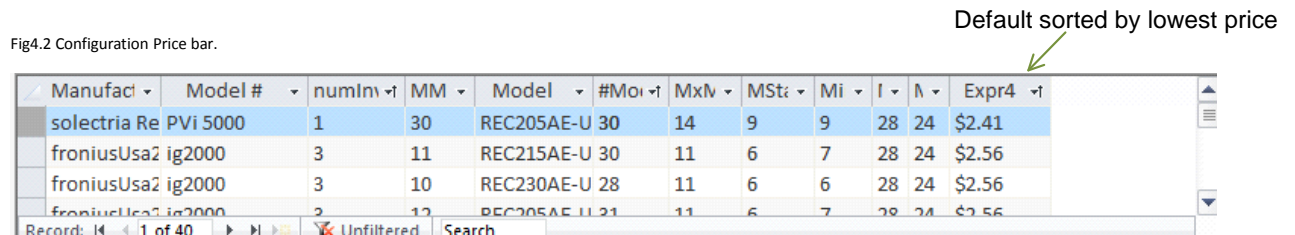
Which you only need 24 of. And can series string them from 7 to 13 modules.

2 series strings of 12 modules meets the requirement, And still fits in low profile (28 max) or High profile (24 max)mounting. Utilizing 78% or 67% or available space.

If this bar is blank, You have most likely exceeded space vs. desired system size. Make adjustments to desired offset or confirm space size. (other limiting factors may also apply, see help and website FAQ)

In the next form and second version "Price bar", (fig. 4.2) we now add pricing to the solution. Based on unit pricing of modules and inverters that you can preload.

We break it down to per watt for the # of modules/inverter(s) and suggested system size.



Any column can be filtered or sorted by clicking the "Arrow" in heading

4. Now using the configurator bar, you can select a potential system and string the modules to provide your best price, minimal modules or inverters.

Here in the fourth screen, based on the row selected, Inverter and modules specifications are shown to allow you to string the modules to make your systems power. Understanding series and parallel circuits is required to build your system

The screenshot shows the 'Array Spec' window of the Turbo PV Solar software. It features a table of system configurations with columns for Manufacture, Model #, numIn, MM, Model, #Mod, MxV, MSt, MI, I, A, and Expr4. The third row is selected, showing Kaco 1501xi modules and a KD210GX inverter. Below the table, the 'INVERTER' and 'MODULE' specifications are displayed. The 'INVERTER' section shows details for the Kaco 1501xi, including Nom Out V, Max Out Cur, Max OCPO, Weighted CEC EFF, and MPP Tracking Voltage. The 'MODULE' section shows details for the KD210GX, including STC, PTC, Vmp, Voc, Imp, Tco Pmp, Tco Voc, Tco Isc, and Max fuse. A 'Last Saved Configuration' panel on the right allows saving the current configuration with an Invid and ModID. At the bottom, a table shows the estimated gross installed cost and per DC watt cost for the selected system, including STC/W Rebate and Federal ITC.

Selected row brings to focus

inverter & module specifications

Enter the number of modules to configure your system strings.

And see potential installed costs*

*(installed costs are a function of estimating BOS, permits, racking, installation conduit & wire. As a percentage of overall costs.) See system pricing criteria

Once you have selected and strung modules, SAVE the configuration, this will queue it for reporting. If you move to another record, cells will change to yellow.

Go to Advanced menu button to do a review of rate increase, rebates or incentive

The screenshot shows the 'Advanced' menu of the Turbo PV Solar software. It includes sections for 'Anticipated yearly electric rate increase' (5.00%), 'Monthly Connection charge' (\$8.00), 'Financial incentives' (PBI or REC value / Mw, Federal ITC, State rebate per W, Additional Upfront Rebate), and 'Find Incentives & Rebates for your area' (www.desireusa.org/solar). There are buttons for 'System Report', 'One Line Diagram', and 'Pricing Modules & Inverters'. A 'Percentage of module & inverter price to overall costs' field is set to 60%. A note at the bottom states: 'Modules & Inverters can represent a significant portion of your investment. By default 60% of a simple system, but anywhere from 40 to 70% of installed cost depending on how complicated your system is and or local labor and permittng fees. Consult a solar pro , electrician and your AHJ for more detailed costs.'

Edit electrical cost escalation
Monthly connection charges

Add Performance Based Incentives
or Renewable Energy Credit values

Per Watt upfront rebates, or just cash
incentives

Estimate the percentage BOS cost
are to overall system

Then view and print/save your
reports

[Back to Index](#)

De-Rating the system

De-rates, are the variable that is estimated from you BOS design. and location. Estimated your de-rate to be included with the calculations.

Desired electric offset from PV: 50% 3.5 AC watts from PV 900 Kwh/month avg.
4.8 Est STC array size

At this point we've collected you location and desired electric, now the size of your system will depend on available space and its orientation as well as system de-rates

Type of Mount: Roof standoff mount

Orientation: 220 Text34: Tilt/ slope: 20 Text36: 4.25

System De-Rates: 0.903 User Defined De-rates

sitting length: 70 476 Approx Sq ft Desired Array size
sitting width: 16 1120 Defined sq ft

Manufactur	Model #	# Li	Mx	Mxl	Manufactur	Model	#M	MxV	M	Mir	Ma	Ma	LP	HP
solectria Ren	PVi 5000	1	2	27 REC	REC225AE-US	21	13	9	8	48	42	76%	67%	
solectria Ren	PVi 5000	1	2	26 REC	REC230AE-US	21	13	8	8	48	42	76%	67%	
sMa america	sb 70000U	1	3	38 REC	REC230AE-US	21	13	11	10	48	42	76%	67%	

Record: 14 1 of 40 No Filter Search

From form 3, Mount & Orientation you may select "System De-Rates" to edit user inputs of the system

tbIDRateNC

Est. Temp Effect = PTC/STC If cell temperature effects output power. And PTC is an implied temperature correction. Then we can use PTC/STC to estimate a temp derate for initial sizing.

Module Tolerance = STC - Tol % Module manufactures may state a tolerance +/- of nameplate power out of the box, excluding any warranted output values. We take neg tol off STC when sizing a system.

Inverter Conversion Efficiency CEC Weighted eff. The inverters ability to convert DC to AC is an important de-rate. While many manufactures list a MAX eff. We like CEC weighted. Due to the wide range of conditions that are factored in this rating.

Mismatch: 0.98 Even identical modules under like conditions have a slight loss in electrical characteristics. If you Mix modules of different characteristics, this value of loss can increase dramatically.

Connections and Diodes: 0.99 Electrical Connections inherently form resistance, ensuring connections are properly torqued and of proper componts ensures minimizing this factor. If diodes are added outside of the modules or strings to minimize effect of shading, the added resistance must be considered.

Soiling: 0.98 Dust, polland and snow on a module reduces the amount of sun light reaching the cells. Typical rain fall is usually enough to keep modules clean most of the time. But after dust storms or polland season, extra washings are nessasary to maintain peak performance.

wirelose: 0.96 Conductors have loss dictated by Ohms Law: $V = I \times R$. The distance to power conditioning/ distribution equipment and conductor size effects this loss. In most electrical applications 5% is tolerable. But in PV the object is usable/exportable power and 3% is capable with proper wire and voltage sizing.

Availability: 1 Storms that knock out the grid or any maintenance to the system effect availability. 2% represents approx 7 days per year of not being able to export power. If you have more or less frequent outages adjust this factor.

Age: 0 Default value is new or 0. Module performance deteriorates with age. If you checking old/used modules. Enter year old = -1% per year.

Shading: 1 Like night, shading is the enemy of solar production. Electrically interconnected devises typically operate at the maximum of the weakest link. If cells are connected into strings, and strings to panels, and panels to array's. then the sum of production is all cells operating under like conditions. Shading changes the characteristics of individual cells and thus production. Some shading can be tolerated by upsizing the array or mitigation technology. But too much disqualifies a location as not being economical.

Enter values 1 -% as decimal, except age

Save

System DeRate: 0.913 Excluding, Temp, Tol_Inverter Eff.

De-rates are an integral part of system design, they take into account factors outside of the efficiencies of temperature, modules and inverters.

The first 3 parts of de-rate are dependent of selected components

But other de-rates exist outside of these, such as shading, wire loss, & soiling

Here you apply estimated derates to be used in sizing your system and performance.

[Back to Index](#)

Reports

3 basic reports currently available from TPVS.

1. System report is a 3 page report, of user entered data, estimated system size, cost and savings over time.
2. One line diagram, is great for conveying the idea to installer or local authorities in the pre planning phase.
3. And then the Financial analysis that export's to excel for you to add calculations as you see fit to help make your best deal (Msft Excel required. This report is also include in system report for printing or email purpose.)

Turbo PV Solar

John Q Public
123 Any street
Hartfield PA 19440
Saturday, February 11, 2012

Design Parameters

Electric Use
Avg. kWh/month: 300
Avg. kWh/year: 3600
Avg. kWh cost: \$0.1055
Targeted AC Production from PV: 50 %
Targeted AC Production from PV: 5400 kWh/year

Weather data
WSN: No. 14727 City: ALLENTOWN PA miles away: 25.0
4.4 Due S. Lat: 40.0 Read Loc Temp: -24.7 C
Average peak sun hours: 4.4 @ 20° W. Mounting Orientation

Mounting
Orientation: Azimuth: 180 Tilt: 20
Roof rafter mount: 180
Shading: 0.00% Tilt: 20
Mounting space: 180
Racking length: 180
Racking width: 20
1000 Defined Sq Ft.

Proposed System
340 Wp/STC 55kwh/yr net

Solar Electric (PV) kWh Product

Copyright 2011 Turbo PV Solar. No Commercial use authorized

System report

User entered parameters of the design.

Weather station data user for calculations

Site conditions of orientation, tilt and available space

Proposed system size and optional site picture.

Graph of estimated monthly production and 1st year savings

Turbo PV Solar

John Q Public
123 Any street
Hartfield PA 19440
Saturday, February 11, 2012

Estimated annual electric rate increase: 2.00%
Average SREC of \$0.25 per kWh \$0.00 for term of 20 years

Year	Yr kWh Use	Yr kWh Cost	Yr Cost W/O Solar	Solar kWh Production	Utility kWh Savings	S.6 SFR/W Value	Cumulative Savings	Net Pay
Yr01	13600	\$0.1055	\$1,435.40	4,347	\$737.82	\$1,065.58	\$1,130.90	(\$10)
Yr02	13600	\$0.1055	\$1,435.40	4,346	\$737.82	\$1,065.58	\$1,555.86	(\$10)
Yr03	13600	\$0.1055	\$1,435.40	4,325	\$739.07	\$1,065.58	\$1,551.55	(\$9)
Yr04	13600	\$0.1055	\$1,435.40	4,300	\$739.97	\$1,065.58	\$1,496.60	(\$9)
Yr05	13600	\$0.1055	\$1,435.40	4,322	\$739.97	\$1,065.58	\$1,471.85	(\$7)
Yr06	13600	\$0.1055	\$1,435.40	4,320	\$739.97	\$1,065.58	\$1,338.97	(\$6)
Yr07	13600	\$0.1055	\$1,435.40	4,320	\$739.97	\$1,065.58	\$1,230.39	(\$5)
Yr08	13600	\$0.1055	\$1,435.40	4,320	\$739.97	\$1,065.58	\$1,230.39	(\$4)
Yr09	13600	\$0.1055	\$1,435.40	4,320	\$739.97	\$1,065.58	\$1,230.39	(\$3)
Yr10	13600	\$0.1055	\$1,435.40	4,320	\$739.97	\$1,065.58	\$1,230.39	(\$2)
Yr11	13600	\$0.1055	\$1,435.40	4,320	\$739.97	\$1,065.58	\$1,230.39	(\$1)
Yr12	13600	\$0.1055	\$1,435.40	4,320	\$739.97	\$1,065.58	\$1,230.39	(\$1)
Yr13	13600	\$0.1055	\$1,435.40	4,320	\$739.97	\$1,065.58	\$1,230.39	(\$1)
Yr14	13600	\$0.1055	\$1,435.40	4,320	\$739.97	\$1,065.58	\$1,230.39	(\$1)
Yr15	13600	\$0.1055	\$1,435.40	4,320	\$739.97	\$1,065.58	\$1,230.39	(\$1)
Yr16	13600	\$0.1055	\$1,435.40	4,320	\$739.97	\$1,065.58	\$1,230.39	(\$1)
Yr17	13600	\$0.1055	\$1,435.40	4,320	\$739.97	\$1,065.58	\$1,230.39	(\$1)
Yr18	13600	\$0.1055	\$1,435.40	4,320	\$739.97	\$1,065.58	\$1,230.39	(\$1)
Yr19	13600	\$0.1055	\$1,435.40	4,320	\$739.97	\$1,065.58	\$1,230.39	(\$1)
Yr20	13600	\$0.1055	\$1,435.40	4,320	\$739.97	\$1,065.58	\$1,230.39	(\$1)

Copyright 2011 Turbo PV Solar. No Commercial use authorized

Page 3 of 3

Page 3, Financial analysis page, reports estimated cost of electric as increased year over year

Estimated PV Production, with electrical cost savings. And potential SREC or other incentive.

Simple payback, on costs of your initial investment.

Page 2 gives a summary of major components of modules and inverters

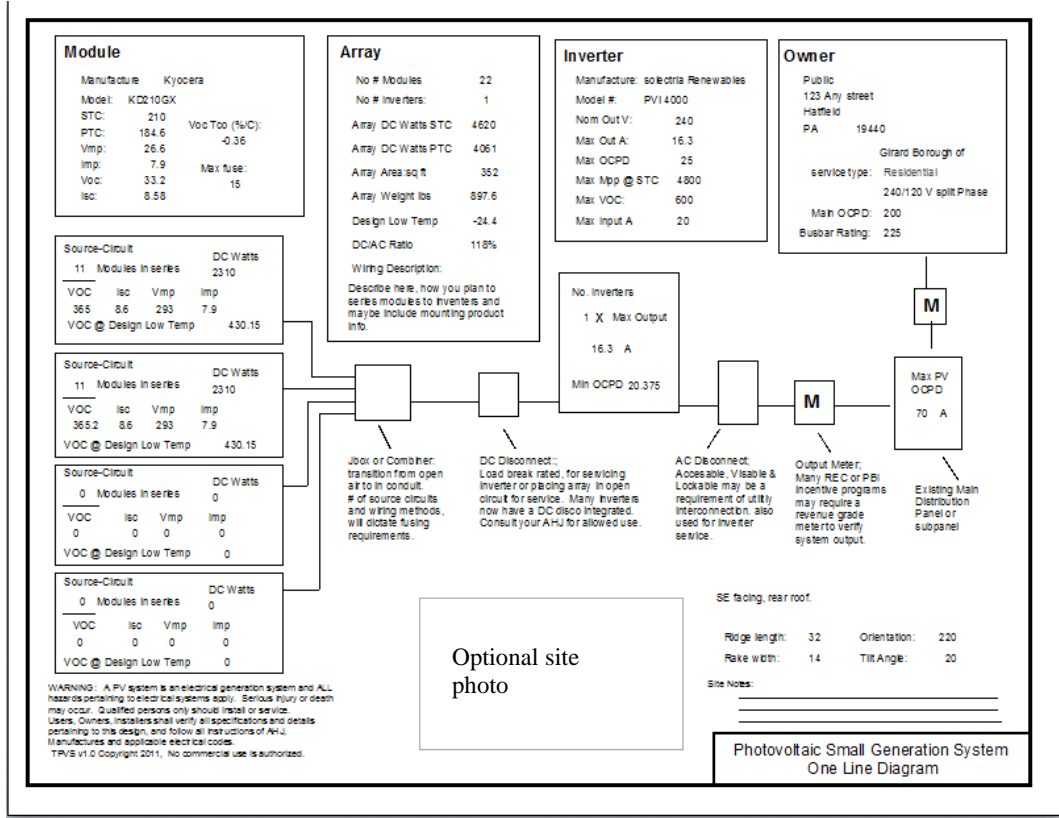
Summary of gross cost minus rebates & incentives

Then breaks those cost down to estimated kWh cost, Gross, Net and over 20 years.

With a comparison of doing nothing and continuing to pay for your electricity from the provider.

One Line Diagram

Here we turn your idea into a picture, offering information that helps to design the balance of system (BOS) of wire, disconnects and mounting.



Export Financial Analysis to excel

Year	YrKwh Use	Yr Kwh Cost	Yr Cost W/O Solar	Solar Kwh Production	Utility Savings	Est BPI/Yr Value	Cumulative Savings	Net Cost Payback
Yr01	10800	\$0.1560	\$1,780.80	5,283	\$824.11	\$132.07	\$956.18	(\$13,321.12)
Yr02	10800	\$0.1638	\$1,865.04	5,256	\$860.99	\$131.41	\$1,948.59	(\$12,328.72)
Yr03	10800	\$0.1716	\$1,949.28	5,230	\$897.46	\$130.75	\$2,976.80	(\$11,300.51)
Yr04	10800	\$0.1794	\$2,033.52	5,204	\$933.52	\$130.09	\$4,040.40	(\$10,236.91)
Yr05	10800	\$0.1872	\$2,117.76	5,177	\$969.16	\$129.43	\$5,138.99	(\$9,138.32)
Yr06	10800	\$0.1950	\$2,202.00	5,151	\$1,004.39	\$128.77	\$6,272.14	(\$8,005.16)
Yr07	10800	\$0.2028	\$2,286.24	5,124	\$1,039.21	\$128.11	\$7,439.46	(\$6,837.85)

Take page 3 of system report to excel to add additional calculations on your own.

User computer must have 2003 or higher excel installed.

A1	year #	A	B	C	D	E	F	G	H	I	J
1	year #	YrKwh	YrKwhcost	CostWO	KwhProduct	Savings	RECvalue	Text39	Text110		
2	Yr01	10800	\$0.16	\$1,780.80	5,283.00	\$824.11	\$132.07	956.18	-19321.12		
3	Yr02	10800	\$0.16	\$1,865.04	5,256.00	\$860.99	\$131.41	1948.59	-12328.72		
4	Yr03	10800	\$0.17	\$1,949.28	5,230.00	\$897.46	\$130.75	2976.8	-11300.51		
5	Yr04	10800	\$0.18	\$2,033.52	5,204.00	\$933.52	\$130.09	4040.4	-10236.91		
6	Yr05	10800	\$0.19	\$2,117.76	5,177.00	\$969.16	\$129.43	5138.99	-9138.32		
7	Yr06	10800	\$0.20	\$2,202.00	5,151.00	\$1,004.39	\$128.77	6272.14	-8005.16		
8	Yr07	10800	\$0.21	\$2,286.24	5,124.00	\$1,039.21	\$128.11	7439.46	-6837.85		
9	Yr08	10800	\$0.21	\$2,370.48	5,098.00	\$1,073.61	\$127.45	8640.32	-5636.79		

[Back to Index](#)

Update pricing

In DEMO version this function is disabled

From the Advanced Menu by clicking (Module & Inverter Pricing button)

Module & Inverter Pricing

Modules

Module prices are scalable, the more you buy the less they cost per Watt. Here we can designate the tiers in which these pricebreaks occur. Enter full unit pricing, \$ per Watt x STC

vendor	Item	tier1low	tier1high	teir1price	teir2low	teir2high	teir2price
TPVS	REC205AE-USA	1	10	\$526.00	11	75	\$500.00
TPVS	REC225AE-USA	1	10	\$524.00	11	115	\$512.00
TPVS	REC210AE-USA	1	10	\$565.00	11	75	\$545.00
TPVS	REC215AE-USA	1	10	\$575.00	11	50	\$564.00
TPVS	REC230AE-USA	1	10	\$575.00	11	110	\$520.00

Records: 1 of 6 Unfiltered Search

Inverter

Inverter's can be scalable on a per unit price. Buy 1 for X, or buy 2 or more for Y.

vendor	Item	price1	price2	price3	price4
TPVS	M175-24-240-s	\$155.00	\$145.00	\$0.00	\$0.00
TPVS	IG3000	\$1,995.00	\$1,995.00	\$0.00	\$0.00
TPVS	PVI-5000-OUTD-US240	\$2,795.00	\$0.00	\$0.00	\$0.00
TPVS	gT2.8	\$1,695.00	\$0.00	\$0.00	\$0.00
TPVS	PVI-6000-OUTD-US240	\$3,495.00	\$0.00	\$0.00	\$0.00

Records: 1 of 8 No Filter Search

Edit/Add Module

Edit/Add Inverter

Here you can edit the pricing of modules and inverters that will be evaluated.

Modules and Inverters are scalable, meaning the more you buy the less expensive they can get. Enter the price break low & high quantities and corresponding prices.

The Edit/Add buttons will open the new forms in which you can edit existing or edit those contained in database

Edit Modules

ID

1

Cell Type

poly

Model

BP 3115J

of J box

1

STC

115

Frame color

silver

PTC

Backsheet Color

P tol + %

0.03

L (in)

59.45

P tol - %

0.03

W (in)

26.54

Mp Sqft

10.5

D (in)

1.97

Mod eff%

11.3

Weight (lbs)

26.64

Cell eff%

Mat warrenty

5

The address is not valid

Most likely causes:

- There might be a typing error in the
- If you clicked on a link, it may be out

What you can try:

- Retype the address.
- Go back to the previous page.

ID	Model	STC	PTC	P tol + %	P tol - %	Mp Sqft	Mod eff%	Cell eff	Vmp	Imp	Voc	Isc	Pmp temp
1	BP 3115J	115		0.03	0.03	10.5	11.3		17.1	6.7	21.8	7.5	-0.47
2	BP 3125 J	125		0.03	0.03	11.4	12.3		17.4	7.2	22	8.1	-0.47
3	SX 3140 J	140		0.09	0.09	12.8	13.8		17.5	8	22	8.2	-0.47
4	SX 3165 B	165	146.1	0.09	0.09	12.2	13.1		35.2	4.7	44.2	5.1	-0.47
5	SX 3170 I	170	150.6	0.09	0.09	12	13.1		35.4	4.8	44.2	5.27	-0.47
6	BP 170 I	170		0.05	0.05	12	13.1		35.4	4.8	43.6	5.27	-0.47
7	BP 170 B	170		0.05	0.05	12.6	13.5		35.4	4.8	43.6	5.27	-0.47
8	SX 3175 B	175	155.2	0.09	0.09	12.9	13.9		36.1	4.9	44.2	5.3	-0.47

Records: 1 of 281 No Filter Search

Web link to manufacture site or datasheet

Edit data of existing modules in database or add your own.

Split form, Standard on top, Table or datasheet view at bottom, datasheet view can be sorted or filtered on each column.

Add New

Inverter form is similar in design

[Back to Index](#)

TPVS Help Page 8.1

Website, Help & Support

Having problems with your download, installing or operating TPVS contact support@turbopvsolar.com

Please note, Support is limited to installing and operating the application.

TPVS does not sell PV equipment or installation services.

We do not offer specific advice on any system, nor make any recommendations of modules or inverters.

Online support and additional resources. www.turbopvsolar.com/TPVShelp.html