

## SMART ENTERPRISE - ACCOUNT

**PERFORMANCE** To manage a portfolio of multiple sites, they can be grouped for access with a single login using a SolarVu SMART Enterprise account. Apply to contact us at [cachelan@cachelan.com](mailto:cachelan@cachelan.com) to set up an Enterprise account. From a single screen, view status of all sites, sort by different parameters, compare performance for any time period, print PDF reports, download CSV data files for analysis or jump directly to any site.

Performance tab

Performance		Report		Aug 7, 2015, Fri 9:44 AM (GMT -5:00)								
GROUP	2 Ontario Schools Portfolio	PROFILE	3 Avenue	PERIOD	4 Time	Edit	Help					
<b>9</b>	<b>9</b>	Status	Name	6	Run Time	Sell Power Now	Output % SolarMap	Sell Size	Sell Energy	Sell Rate	Sell Revenue	Setup
	Total	52			505 kW			1,168 kW	3,365 MWh		\$ 2,483,818	
1	Durham College			5.7 Years	35.4 kW	100 %	70.0 kW	496,080 kWh	\$ 0.80	\$ 396,864	Setup	
2	Blessed Cardinal Newman			3.4 Years	71 kW	117 %	100 kW	512,554 kWh	\$ 0.71	\$ 365,451	Setup	
3	Mary Honeywell ES			2.0 Years	90 kW	80 %	150 kW	306,762 kWh	\$ 0.71	\$ 218,721	Setup	
4	Cairine Wilson SS			2.1 Years	44.7 kW	55 %	100 kW	151,090 kWh	\$ 0.71	\$ 107,727	Setup	
5	Kipling Collegiate Institute			3.4 Years	0 kW	75 %	40.0 kW	133,095 kWh	\$ 0.71	\$ 94,897	Setup	

Report tab

Performance		Report		1							
GROUP	9 Ontario Schools Portfolio	PROFILE	10 Revenue	11 PERIOD	12 Life Time	13 Edit	14 Help	PDF (CSV)	Download		
<b>9</b>	<b>9</b>	Name	10	Run Time	Sell Power Now	Output % SolarMap	Sell Size	Sell Energy	Sell Rate	Sell Revenue	
Total	52			472 kW			1,168 kW	3,365 MWh		\$ 2,483,907	
1	Durham College			5.7 Years	38.1 kW	100 %	70.0 kW	496,086 kWh	\$ 0.80	\$ 396,869	
2	Blessed Cardinal Newman			3.4 Years	70 kW	117 %	100 kW	512,579 kWh	\$ 0.71	\$ 365,469	

- Performance** View online status of all sites including fault alarms and communications health. Select from different parameters arranged into profiles over any time period such as power now, energy and revenue.
- Report** Select the desired Group, Profile and Period then create a PDF report for any displayed view for all or a subgroup of sites. Use the Type pulldown and Download button to download data in CSV format for performance analysis in a spreadsheet.
- GROUP** View all sites on one screen or divide a large portfolio into smaller related groups of sites for display separately. Only the sites in the selected group will be visible and totalled for display and reports.
- PROFILE** Choose related parameters for display and reports. Create and name new profiles as needed to suit personal preferences.
- PERIOD** Choose a time period of interest. Data is stored for the lifetime of the system since start up. The values will be shown for the selected time interval. Totals will automatically be displayed for the time period in the first row.
- PARAMETER** Create a profile with the required parameters for display from over 25 measured values. Click on the parameter of interest to sort sites in ascending order by that parameter. Click again for descending order. To find sites alphabetically, click on the Name header.
- NAME** Each site is identified with its default SolarVu web address assigned at the factory, an alias alternative address and a site name, both of which are assigned in SETUP. Sort all sites by the preferred method of identification selected with the Name arrow button. Click the site name to go directly to the site energy portal SITE view.
- COMMUNICATION & ALARM STATUS**  
Comm Light: Green-internet connection OK. Red-No internet connection for last 2 hours. Yellow-partial internet connection. Check for poor 3G cellular signal, intermittent ISP connection, no LAN connection if the Comm light is not green.  
Alarm Light: Green- all devices reporting OK. Red-caused by inverter fault code, Sun Low Power alarm (WeatherTrak), Combiner alarm, no serial data (inverter is off, sleeping or connection problem).  
Click on the Status - Alarm or Comm heading to sort sites by those that have a problem. Click on the indicator to go directly to the site ANALYZER screen with diagnostic information about the problem. To go directly to the site LIVE view, click on the site name for more details. Click on the site number in the left column if it is underlined, to get a popup of maintenance notes that have been entered in the site SETUP. This is helpful for O&M staff to view what work has been done on the site.
- SETUP** To change settings for a site, click the Setup button. This button will only appear if the login was with the administrator password. Visitor login only allows looking at the site but not changing settings.
- CREATE PROFILE** To edit an existing Profile or create a new named Group of parameters for display, click the Edit button or white arrow shortcut. This is only available to accounts with administrator privileges.

## GROUPS & PROFILES

**CREATE & EDIT GROUPS** Your SMART Enterprise account will come with a factory default Group called All to display every site. Customize your account to subdivide a large portfolio into smaller groups of sites for display together. An administrator login is required to make these changes.

Select Edit from Login screen

Select Group and action

Group Add/Edit screen

Name	Default Web Address	Alias Web Address
École Publique Le Coeur du Nord	lecoeur.solarvu.net	
<input checked="" type="checkbox"/> École Secondaire Étienne-Brûlé	etiennebrule.solarvu.net	
<input type="checkbox"/> École élémentaire catholique Alain-Fortin	afortin.solarvu.net	
<input type="checkbox"/> École élémentaire catholique Arc-en-ciel	arceniel.solarvu.net	
<input checked="" type="checkbox"/> Ecole élémentaire catholique Bernard-Grandmaitre	grandmaitre.solarvu.net	
<input checked="" type="checkbox"/> Ecole élémentaire catholique de la Découverte	découverteott.solarvu.net	
<input type="checkbox"/> École élémentaire catholique Jean-Robert-Gauthier	jrgauthier.solarvu.net	
<input type="checkbox"/> École élémentaire catholique l'Étoile-de-l'Est	letoiledelest.solarvu.net	
<input checked="" type="checkbox"/> École élémentaire catholique La Vérendrye	laverendrye.solarvu.net	
<input type="checkbox"/> École élémentaire catholique Montfort	montfort.solarvu.net	
<input type="checkbox"/> École élémentaire catholique Élisabeth-Bruyère	ebruylere.solarvu.net	
<input type="checkbox"/> Édouard-Bond	edouardbond.solarvu.net	

- GROUP SETUP** Create, edit or delete a group by clicking the Edit button or arrow shortcut.
- GROUP TAB** Select the Group tab to make changes to Groups.
- ACTION** Delete or edit an existing group. Click the Add button to create a new group of sites.
- GROUP NAME** Assign a meaningful name that will appear in the Group pulldown box.
- REFERENCE** Optionally add a Reference to appear in the Group edit list for further details
- SELECT SITES** Check each site from the total of all sites in the portfolio that should appear in this group.
- SAVE** Click Save to retain the group or Exit without Save to abandon it.
- EXIT** Once all sites are selected and saved, click Exit to return to the main screen. This group can be edited later to add or delete sites by returning to the Group setup screen and selecting the Edit button.

## PROFILES - CONFIGURATION

**CREATE & EDIT PROFILES** Your SMART Enterprise account will come with factory default Profile combinations of parameters. Arrange parameters into Profiles to see only those measured values of interest from over 40 possibilities. An administrator login is required to make these changes.

Select Edit from Login screen

Profile Add/Edit screen

Profile Name:	Delete	Help	Save	Exit
New Profile: Output Capacity	Create			
None				
SELL ENERGY				
Buy Energy				
% Green Energy				
Savings GHG lb				
Sell Lifetime				
Sell Energy				
Sell Power Now				
Sell Revenue				
Sell Rate				
BUY ENERGY				
Buy Lifetime				
Buy Energy				
Buy Power Now				
Buy Cost				
Buy Rate				
PERFORMANCE				
% Green Power				
% Green Energy				

- PROFILE SETUP** Create, edit or delete a profile by clicking the Edit button or arrow shortcut.
- PROFILE TAB** Select the Profile tab to make changes to Profiles.
- ACTION** To create a new profile click the Create button or the Delete button to remove an existing profile.
- PROFILE NAME** Enter a meaningful name like Revenue, Savings or Output that will appear in the Profile pulldown box.
- ASSIGN PARAMETERS** From the pulldown arrow button in the parameter name header, select from over 25 measured parameters for that column. Choose None to make the column blank. In the Performance and Reports screens, these parameters will appear in the order shown and saved here. Create profiles to display different types of information like Revenues, Green Savings, Performance to suit your specific requirements.
- SAVE** Click Save to keep the new profile or changes.
- EXIT** Click Exit to return to the Performance screen. Click Save before Exit to retain the changes.

## PARAMETER DEFINITIONS

**PARAMETER SELECTION** Over 50 different parameters can be selected and arranged into different profiles for creating different views and reports. The definition of each parameter is listed here in order of the selection pulldown menu in Profile Setup

NAME	UNITS	DEFINITION
<b>SELL ENERGY</b>		
<b>Sell Lifetime</b>	\$	Total energy generated \$ over lifetime of system
<b>Sell Energy</b>	kWh	Total energy generated kWh for selected period
<b>Sell Power</b>	kW	Now Actual system power being generated now kW
<b>Sell Revenue</b>	\$	Revenue = FIT rate x energy kWh for the selected period
<b>Sell Rate</b>	\$/kWh	FIT sell rate entered in SETUP used for revenue calculations
<b>BUY ENERGY</b>		
<b>Buy Lifetime</b>	kWh	Grid energy used since start up. Only available is a grid meter is installed.
<b>Buy Energy</b>	kWh	Grid energy used for selected period. Only available is a grid meter is installed.
<b>Buy Power Now</b>	kW	Grid power now. Only available is a grid meter is installed.
<b>Buy Cost</b>	\$	Grid energy * Buy power cost /kWh entered in SETUP. Grid meter must be installed.
<b>Buy Rate</b>	\$	Grid energy * Average cost of power entered in SETUP. Grid meter must be installed.
<b>SITE SPECIFICATION</b>		
<b>Size kWac</b>	kWac	Size kWac Rated total AC output of system kW for 100% capacity
<b>Size kWdc</b>	kWdc	Size kWdc Rated total DC solar panel kW. Usually greater than AC rating
<b>Installation</b>	Date	Installation Date of startup used to calculate run time
<b>Run Time</b>	days	Run Time Run time in days or years from initial startup date entered in SETUP
<b>PERFORMANCE</b>		
<b>Performance Ratio AC</b>	%	Actual energy / (AC capacity * insolation) for selected period
<b>Performance Ratio DC</b>	%	Actual energy / (DC capacity * insolation) for selected period
<b>Expected Energy</b>	kWh	Energy expected from PVsys design for the selected time period. Values from PVsys report must be entered in SETUP
<b>Expected Revenue</b>	\$	Revenue expected = PVsys expected energy x FIT rate for the selected time period. Values from PVsys report must be entered in SETUP
<b>Output kWh/kWac/yr</b>	kWh	Annual energy per kW of installed rated inverter output capacity. Normalized for comparing relative performance of systems with different size of inverter AC output capacity.
<b>Output kWh/kWdc/yr</b>	kWh	Annual energy per kW of installed total DC panel capacity. Normalized for comparing relative performance of systems with different size total DC panels capacity.
<b>Output FSH/day</b>	kWh	Daily energy / AC capacity expressed in FSH (Full Sun Hours). Energy from one FSH is the energy the system would produce for 1 hour of irradiance at 1000W/m^2 (STD)
<b>Solar Map kWh/kWac/yr</b>	kWh	Expected annual energy for per kW of installed AC capacity based on historical records of horizontal insolation as measured for the selected location. This value must be entered in SETUP from a solar map for this location.
<b>Solar Map FSH/Day</b>	FSH	Expected daily energy expressed in FSH (Full Sun Hours) per kW of installed AC capacity based on the solar map value entered in SETUP for this location.
<b>Output Now % Capacity</b>	%	Actual kWac output now / Rated kWac capacity of the system. Total inverter rated output in kWac is entered in SETUP. 100% means the system is generating at full rated output.
<b>Output % solar Map</b>	%	Actual energy/expected energy from a solar map for this location (entered in SETUP) for the selected period.
<b>Output \$/kWac/yr</b>	\$	Annual revenue / kWac rated system capacity. Normalized to allow comparing systems of different size to see which produces more revenue for the same rating.
<b>Output \$/kWdc/yr</b>	\$	Annual revenue / kWdc total rated installed DC panel capacity. Normalized to allow comparing systems with different size DC panel ratings to see which produces more revenue for the same DC rating.

PARAMETER	UNITS	DEFINITION
<b>PERFORMANCE (continued)</b>		
<b>% Green Power</b>	%	(S-G)/S *100 where S= Solar Power kW now, G=grid power kW now. Only available on systems that measure both solar and grid generation. 100% means all power used is coming from solar generation.
<b>% Green Energy</b>	%	(S-G)/S *100 where S= Solar Energy kWh, G=grid energy kWh over the selected time period. Only available on systems that measure both solar and grid generation. 100% means all energy used for the time period came from solar generation.
<b>Forecast energy</b>	kWh	Value entered in SETUP from the PVsys report for expected energy for the selected period.
<b>Forecast Insolation</b>	kWh m-2	Value entered in SETUP from the PVsys report for the expected insolation based on solar map values for the selected period. Used for calculating performance by comparing measured irradiance to assumed irradiance from the PVsys model.
<b>Forecast Revenue</b>	\$	Expected revenue = FIT rate * PVsys forecast energy for the selected period. Used for calculating performance by comparing actual to expected.
<b>Energy kWh Variance</b>	kWh	Actual energy - PVsys forecast energy. PVsys values must be entered in SETUP. Positive values indicate better than expected performance.
<b>Insolation Variance</b>	kWh m-2	Measured insolation - PVsys Expected insolation. PVsys insolation values from a solar map must be entered in SETUP
<b>Revenue \$ Variance</b>	%	Actual revenue / (PVsys expected energy * FIT rate) Positive value indicated higher than expected revenues for the selected period.
<b>Energy % Variance</b>	%	Actual energy / PVsys forecast energy. PVsys values must be entered in SETUP. Positive values indicate better than expected performance.
<b>Insolation % Variance</b>	%	Actual insolation / PVsys forecast insolation. PVsys values must be entered in SETUP. Positive values indicate more insolation (sunlight energy) received than expected for the selected period.
<b>Revenue % Variance</b>	%	Revenue / Expected revenue as calculated by the PVsys model. Positive values indicate better than expected performance for the selected period.

## POWERWATCH

<b>Power Ratio Yesterday</b>		Lowest inverter power / highest inverter power at 12PM yesterday.
<b>Energy Ratio Yesterday</b>		Lowest inverter energy yesterday / Highest inverter energy yesterday
<b>Energy Ratio Today</b>		Lowest inverter power / highest inverter power today. NA displayed if not available
<b>kWh/kWac Yesterday</b>		Total energy / rated AC capacity yesterday. Used to compare relative output of different size systems
<b>Actual FSH Yesterday</b>		Amount of insolation received yesterday in FSH (full sun hours). 1 FSH = 1000 w/m2
<b>Performance Ratio AC Yesterday</b>		Actual energy / (AC capacity * insolation) for yesterday. Shows actual to expected output
<b>Performance Ratio DC Yesterday</b>		Actual energy / (DC capacity * insolation) for yesterday. Shows actual to expected output

## WEATHERTRAK

<b>Irradiance Now</b>	W/m-2	Measured irradiance at the site now from the WeatherTrak sensor
<b>Insolation</b>	kWh/m-2	Measured insolation for the selected period from the WeatherTrak sensor.
<b>Lifetime Insolation</b>	kWh/m-2	Insolation (sunlight energy) measured by the WeatherTrak sensor since system start up

## SAVINGS

<b>Savings GHG lb</b>	lb	Energy generated for the selected period is converted to the amount of GHG (green house gas) that would be produced burning fossil fuels to generate the same energy. The conversion rate varies by location and can be changed in SETUP
<b>Savings EV km</b>	km	Energy generated for the selected period is converted to the distance a typical EV could drive assuming 5km/kWh conversion rate
<b>Savings Gasoline litre</b>	litres	Energy generated for the selected period is converted to the amount of gasoline that would be required to produce the same energy.
<b>Savings Notebook hr</b>	hours	Number of hours a typical notebook computer that uses 25W could run from the energy generated over the selected period.
<b>Revenue % Variance</b>	%	Revenue / Expected revenue as calculated by the PVsys model. Positive values indicate better than expected performance for the selected period.

## HISTORY

<b>Views</b>		A measure of how much use the SolarVu portal is getting. Each time a new visitor accesses the portal the view counter is incremented by 1
<b>Last Visit</b>	Date	Last date the SolarVu portal was accessed online. Use this to determine if the site is still being actively used.

## REPORTS

**CREATE REPORTS & DOWNLOAD DATA** Create PDF reports for groups of sites, sorted with different parameters including totals, for any selected time period. Use this to compare sites to each other, check utility payments and do accounting audits. For performance analysis, site data can be exported as a CSV file for further custom analysis in a spreadsheet or imported into a database.

Report configuration screen

Enterprise generated CSV file saved as a spreadsheet/ PDF report

Enterprise generated PDF report

- REPORT** Create, edit or delete a group by clicking the Edit button or arrow shortcut.
- CONFIGURE** Select the Group, Profile and Period for the report. Click on a column header to sort by that parameter. For example, highest to lowest revenue by site for the selected time period.
- FORMAT** Select PDF to receive a formatted PDF report like that shown or CSV to receive a text file that can be imported into a spreadsheet for further analysis.
- DOWNLOAD** The PDF or data file will be downloaded to your computer and stored in a location determined by your browser settings.
- OPEN REPORT** Print the PDF or open the CSV file with a spreadsheet program. Create and save multiple reports for different purposes by site or the whole portfolio.

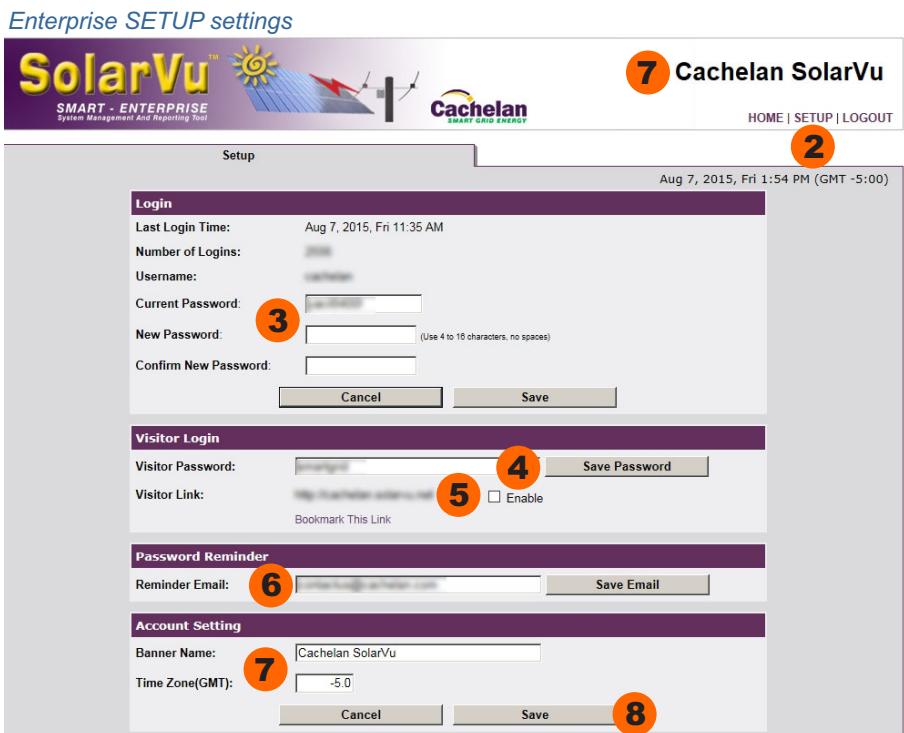
## SMART ENTERPRISE - SETUP

**SETUP** Make changes to your Enterprise account by clicking the SETUP link under the banner. The username is fixed but the administrator password can be changed. A separate Visitor login which does not allow access to site SETUP requires a different password which can be enabled as well as a direct link to the Enterprise account with no login.

Login at [www.cachelan.com](http://www.cachelan.com) with Enterprise username & password



The screenshot shows the Cachelan Smart Grid Energy login interface. It features a purple header with the Cachelan logo and "SMART GRID ENERGY". Below it is a "Home" button. The main area has a "Login" dropdown menu, a "Username" field containing a placeholder, a "Password" field with a red eye icon, and a "Go" button. To the right of the fields is a note: "Accessing SolarVu® Most public SolarVu® enter name in the format mysite gateway label inside th configuration paperwork changes to the configura". A red circle with the number 1 is placed over the "Go" button.



The screenshot shows the "Enterprise SETUP settings" page. At the top is the SolarVu logo with "SMART - ENTERPRISE System Management And Reporting Tool" and the Cachelan "SMART GRID ENERGY" logo. The top right corner shows "7 Cachelan SolarVu", "HOME | SETUP | LOGOUT", and the date "Aug 7, 2015, Fri 1:54 PM (GMT -5:00)". The page is titled "Setup". It contains several sections: "Login" (with fields for Last Login Time, Number of Logins, Username, Current Password, New Password, and Confirm New Password), "Visitor Login" (with fields for Visitor Password, Visitor Link, and a checkbox for Enable), "Password Reminder" (with a field for Reminder Email), and "Account Setting" (with fields for Banner Name and Time Zone(GMT)). Red circles numbered 2 through 8 point to specific elements: 2 points to the "Setup" link in the banner, 3 points to the "Current Password" field in the Login section, 4 points to the "Save Password" button in the Visitor Login section, 5 points to the "Enable" checkbox in the Visitor Login section, 6 points to the "Reminder Email" field in the Password Reminder section, 7 points to the "Banner Name" field in the Account Setting section, and 8 points to the "Save" button in the Account Setting section.

- ENTERPRISE LOG IN** Go to [www.cachelan.com](http://www.cachelan.com) and enter your Enterprise administrator username and password provided by Cachelan.
- SETUP** Click the SETUP link under the banner to make changes to the Enterprise account. Administrator privileges using the administrator password to access the Enterprise account are required.
- ADMINISTRATOR PASSWORD** Change the default administrator password and click Save in the Login panel. The administrator password should only be given to staff that have authority to make changes to every site. Each site has its own direct SETUP login password which is different from the Enterprise password.
- VISITOR ACCESS** For read only viewing of all sites using the Enterprise account, enable a visitor password. This access hides the Setup button for each site to prevent changes. It is suitable to distribute to O&M staff. Save a different visitor password than the administrator password for logging in with the same username to deny change access.
- DIRECT VISITOR LINK** Check the Enable box to create a direct link to the Enterprise account that does not require a password to view the Enterprise account for faster access. Using this method only viewing is allowed, no site changes can be made. Distribute the Visitor Link which can be book-marked in a browser for single click access to the Enterprise account.
- FORGOT PASSWORD** If you can't remember your password when entering the username at the login screen, click the Forgot Your Password? link and the password will be sent to the Reminder Email that you enter here.
- BANNER NAME & TIME ZONE** Enter the account name that you wish to appear in the banner by entering it in the Banner Name box. For the correct time display enter your timezone which is GMT -5 for EST in North America.
- SAVE** Click the Save button to save all changes which come into effect immediately.