

# Visual Building Solar Planning User Manual

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# Visual Building Solar Planning User Manual

## Contents

<b>1</b>	<b>Introduction.....</b>	<b>3</b>
1.1	General .....	3
1.2	Special features of the Solar Planning .....	3
<b>2</b>	<b>The steps to design a PV-System .....</b>	<b>5</b>
2.1	Design of the building outline .....	5
2.2	Adjust the facing.....	9
2.3	Definition of the location.....	9
2.4	Adding the PV modules.....	10
2.4.1	Properties of PV Modules, nominal power, dimensions .....	11
2.4.2	Placing single solar modules .....	12
2.4.3	Placing several solar modules in a grid .....	13
2.4.4	Later Changes of the nominal power and other properties .....	13
2.5	PV Unit Analysis.....	15
2.5.1	Calculation tab .....	15
2.5.2	PV Unit tab .....	17
2.5.3	Parameter tab.....	19
2.6	<i>Shading</i> simulation .....	20
<b>3</b>	<b>Create a New Solar Panel.....</b>	<b>23</b>
3.1	Create new panel .....	23
3.2	Create copy of existing panel .....	29
<b>4</b>	<b>Reports.....</b>	<b>32</b>
4.1	Running a Report.....	32
4.2	Editing a Report.....	34
4.3	Creating a new Report.....	37
4.3.1	Create a logo .....	37
4.3.2	Add a Text Label.....	37
4.4	Report DATA Sources .....	38
4.4.1	Project name and address properties .....	38
4.4.2	Calculated values .....	40
4.4.3	The solar data file.....	41
<b>5</b>	<b>Feed In Tariff Data File.....</b>	<b>42</b>

# Visual Building Solar Planning User Manual

## 1 INTRODUCTION

### 1.1 GENERAL

This manual is for use with the Visual Building Solar Planning. A more detailed explanation of the basic features of Visual Building can be found in the Visual Building User Manual.

Visual Building Solar Planning is an add-on module to Visual Building Professional and Premium designed specifically for solar panel installers.

We suggest that you first review the online tutorial videos found on our website [www.visualbuilding.co.uk](http://www.visualbuilding.co.uk). This manual and the Visual Building User Manual will then be easier to understand.

There are also additional questions / answers found in the user forum on our web site.

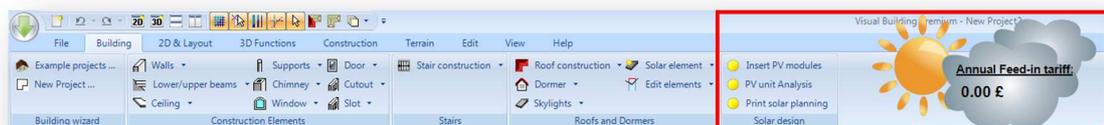
With the Solar Planning-Addon you are able to place PV Modules on roofs and any other areas. After completing the design you can calculate the possible generated power. With this information you can then easily calculate the income generated from the feed in tariff.

The design process is as follows:

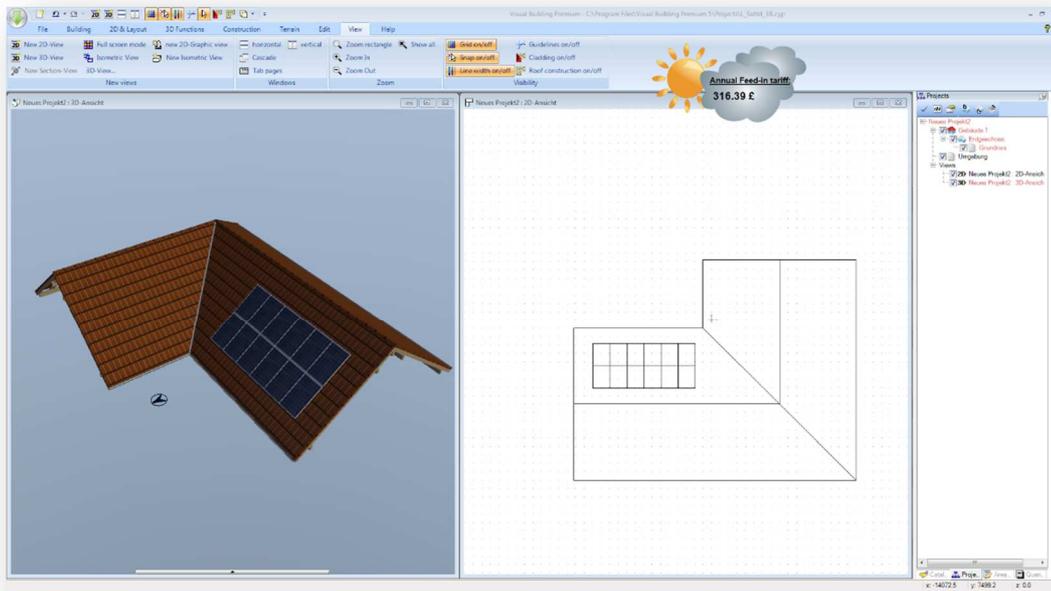
- Enter the building or the building outline or use an existing roof template
- Add dormers, roof windows and chimneys to the roof
- Define the geographical position and orientation of the building
- Define the PV Modules size and other technical specifications
- Calculation is then performed on all entered parameters
- If required, the shadow calculations can be performed

### 1.2 SPECIAL FEATURES OF THE SOLAR PLANNING

The Solar Planning-Plug-in introduces the following tools to the Visual Building Ribbon bar:



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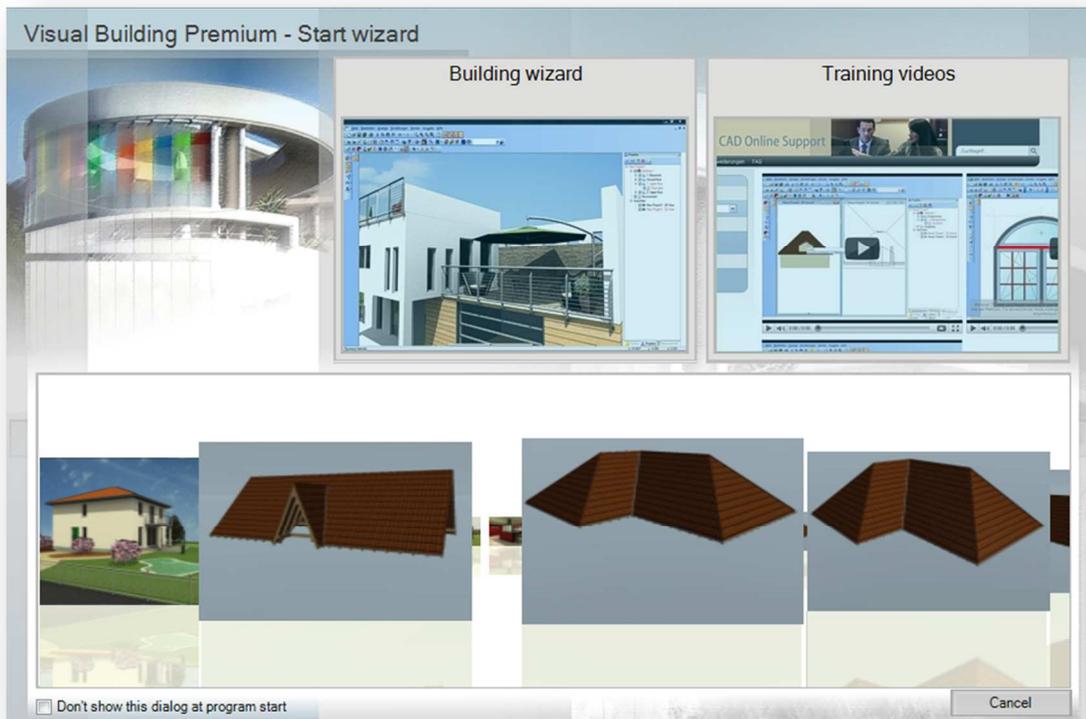


## 2 THE STEPS TO DESIGN A PV-SYSTEM

The creation of the building in the CAD system is both simple and powerful. In this section we will only show the most important functions. Additional features can be found in the CAD software documentation.

### 2.1 DESIGN OF THE BUILDING OUTLINE

Normally the software is started via the Start Wizard. You can access the sample projects and the training videos. It is also possible to start the Building Wizard.



If you are interested in only presenting a roof surface and not an entire building then you can select from one of the simple roof styles in the project carousel. Click on any roof style to load it as a project.

With the **Building Wizard** you can generate a new project in seconds. The scale and the units are predefined, so you can quickly generate a floor plan. See the building outline as an example.

#### **Step 1: Edit Project data**

Enter customer details

# Visual Building Solar Planning User Manual

Wizard  
Step 1 of 5: Edit Project Data

Owner  
Customer No:   
Title: Mr   
Name:   
Street:   
Notes:   
ZIP, City:

Project  
Description:   
Street:   
Notes:   
ZIP, City:

Planner  
Title: Mr   
Name:   
Street:   
Notes:   
ZIP, City:

< Back   Next >   Cancel

## Step 2: Basic Settings and shape selection

Wizard  
Step 2 of 5: Basic settings and shape selection

Basic settings

Unit:   Use fractional measurement.

Grid  
 Enable grid  
Grid size (cm):  12.5  25  50  100  
 User-defined:  mm

Scale  
1:  other 1:

3D-View  
 Create 3D View  
 Terrain visible

General  
 Save as default settings

Floor plan selection

Hall construction / purtin roof

Rectangle

L-shaped, Type 1

L-shaped, Type 2

U-shaped

Front section

Free editing

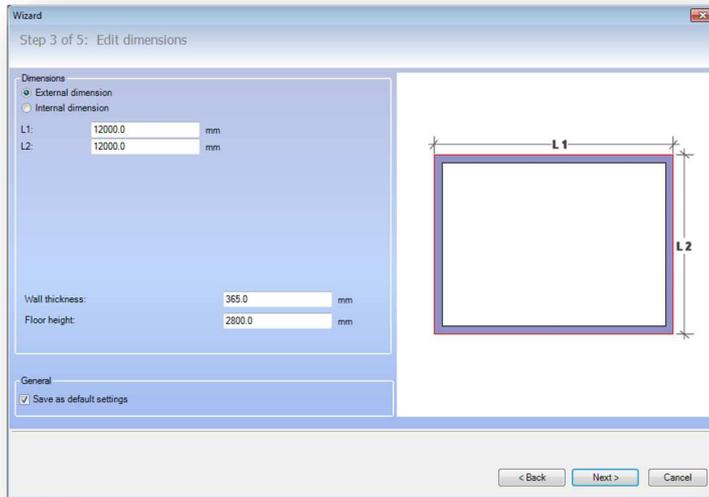
< Back   Next >   Cancel

Select the outline of the building from the predefined shapes. For example **Rectangle**

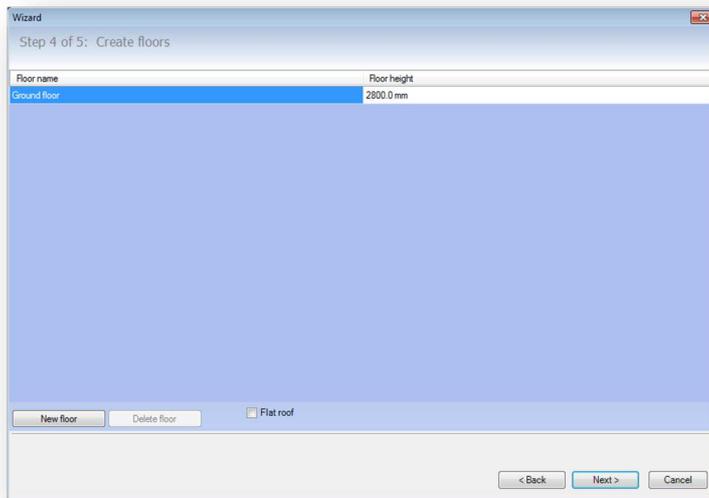
## Step 3: Edit Dimensions

Define the external measurements, the wall thickness and the floor heights.

# Visual Building Solar Planning User Manual



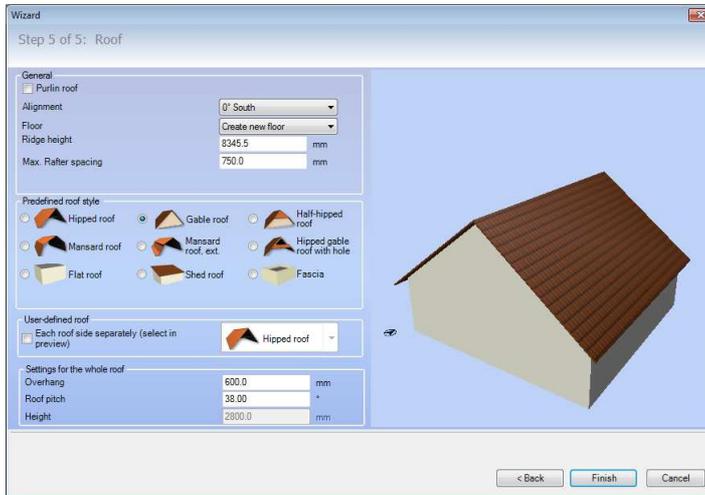
## Step 4: Create Floors



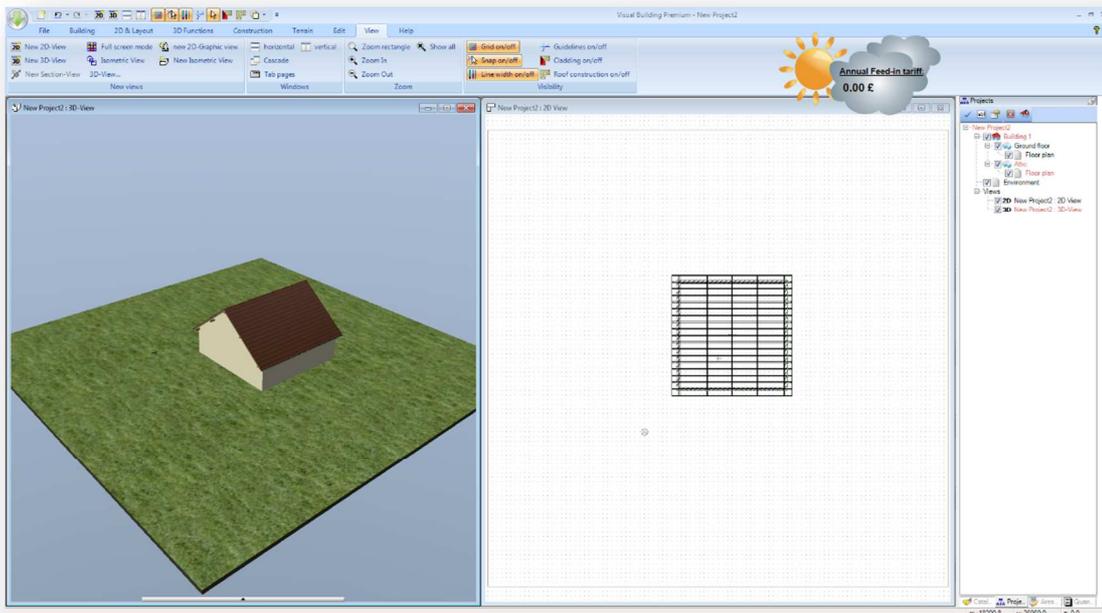
## Step 5: Roof

In this step you define the roof style and pitch and also the facing. All of these details can be edited later in the completed project.

# Visual Building Solar Planning User Manual



Pressing the Finish button will cause a new project to be generated. The the building outline preview attached to the mouse cursor. Click in the 2D or 3D view to place the building outline. During the preview you can change the reference point of the outline building by pressing Ctrl + W key



You then insert the building outline in the project with a left mouse button click.

The Building Wizard generates the exterior walls to define the building. With the standard features of the Visual Building you can also define all additional parts of the building (interior walls, windows, doors etc.). This is completely optional and does not affect the calculations.

# Visual Building Solar Planning User Manual

## 2.2 ADJUST THE FACING

The geographical direction or facing is defined by the compass. The compass is located in the environment layer and can only be changed if this layer is activated and is the current layer in the project viewer.

Activate the 2D View, go to the project viewer and activate the layer environment in the context menu activated with the right mouse button.

As result the building is greyed, because it is on another layer, not the active layer. The compass can now be selected by a mouse click. Double click on the compass icon to activate the North arrow (compass) dialog.



You can now set the compass direction. 0 degrees is facing north, 90 degrees is facing east.

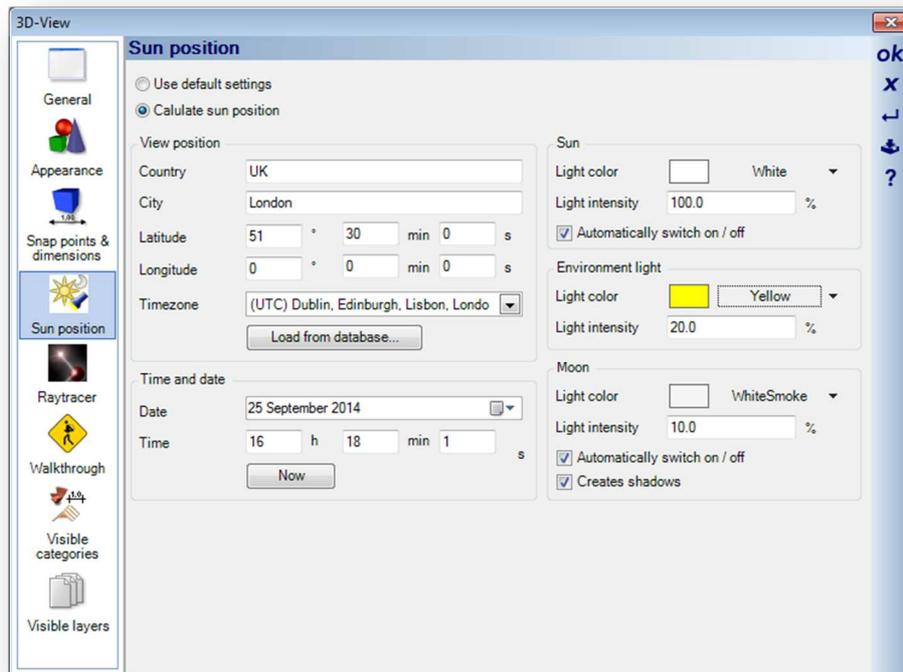
## 2.3 DEFINITION OF THE LOCATION

For the shadow calculation, you can specify the actual geographical location of the building.

Note: For the calculation of the solar gain you have to define the global irradiance of the location using the enclosed map.

The definition of the location is a property of the 3D View. Click with the right mouse button in a free area of the 3D view and in the activated context menu select Properties. You can define the position of the building with the input on the sun position page (longitude and latitude) or choose a position from the database.

# Visual Building Solar Planning User Manual



Use the Save as default button on the right hand edge of the dialog to save this data as your future default. If you save the settings all new 3D views work with these settings. If you do not save the settings you lose the information when you close the 3D view.

## 2.4 ADDING THE PV MODULES

To add the PV modules you use the **Insert PV modules** located in the **Building** tab – **Solar Design** group. Note that these tools are only visible if you have installed the Solar Planning into Visual Building.

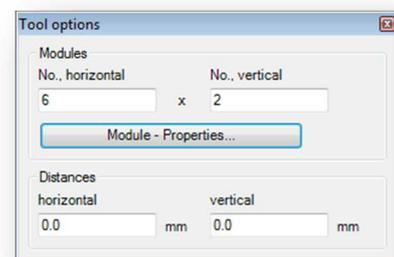
When you select Insert PV modules, you will activate the Tool options dialog.

In this dialog you can specify the PV array size, and spacing.

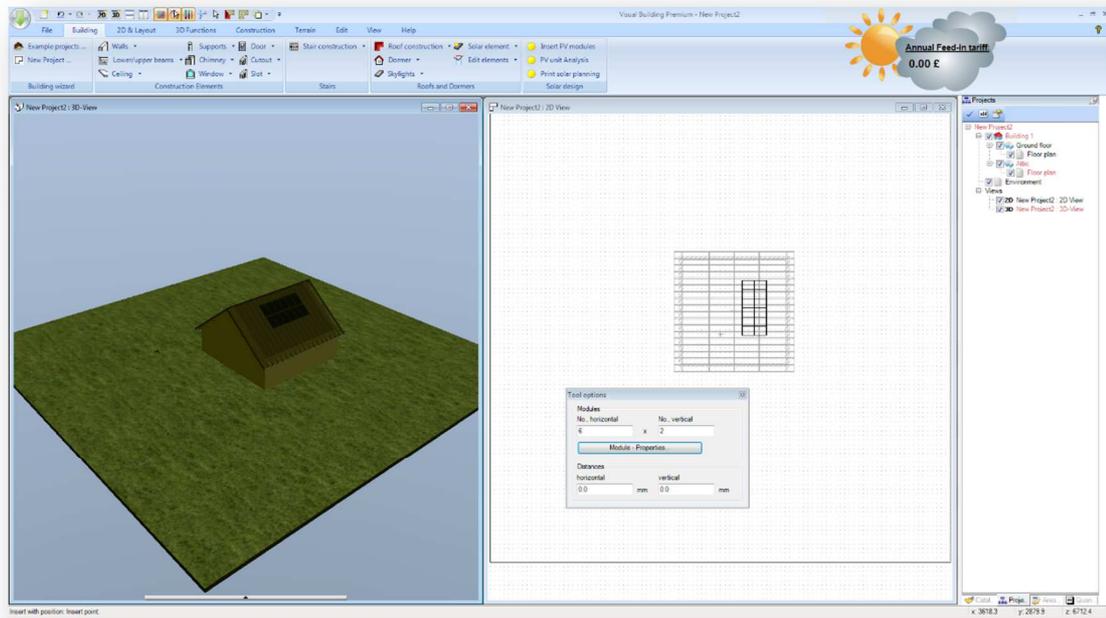
You then select Module Properties to select the PV type.

Select your PV type from the catalogue

You can now place the PV array in either the 2D or 3D view.

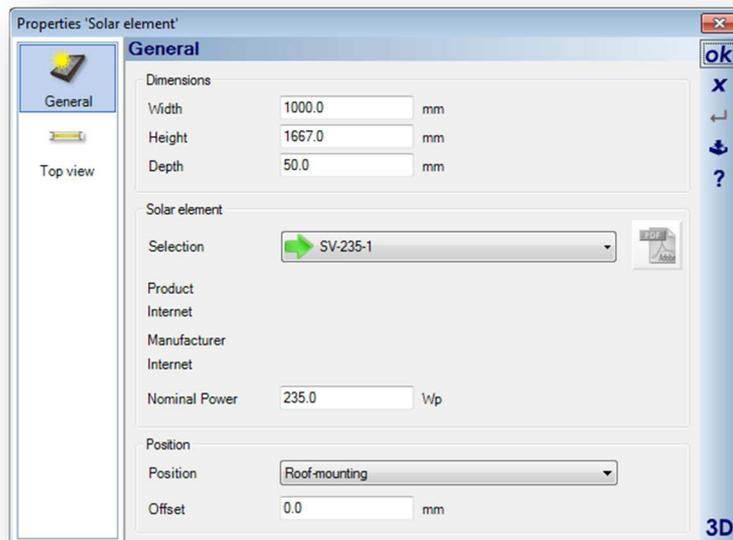


# Visual Building Solar Planning User Manual



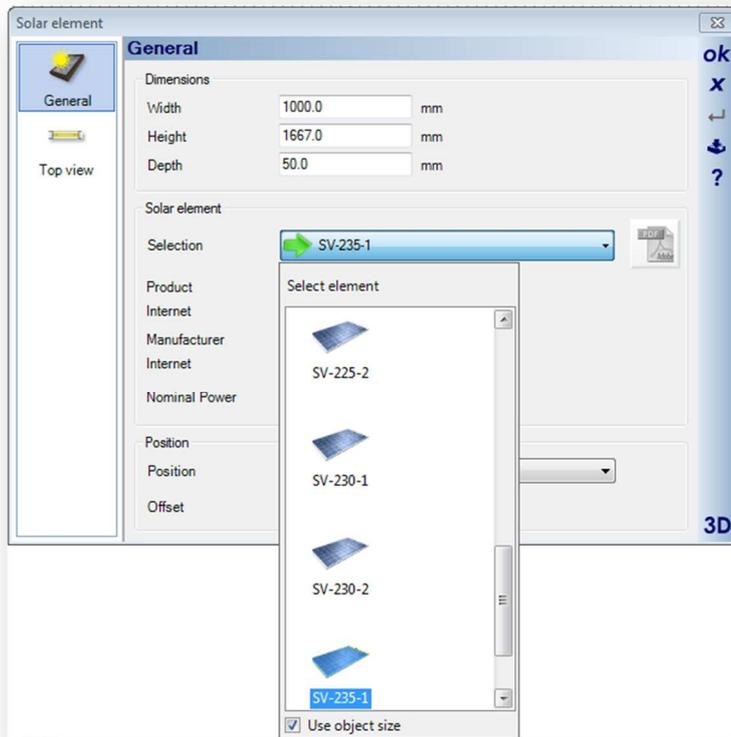
## 2.4.1 Properties of PV Modules, nominal power, dimensions

You can access the properties dialog of a solar module by right clicking on it and selecting Properties from the context menu.



You can edit the dimensions of the modules, the nominal power and the method of fixing. You can choose different modules from the catalogue.

# Visual Building Solar Planning User Manual

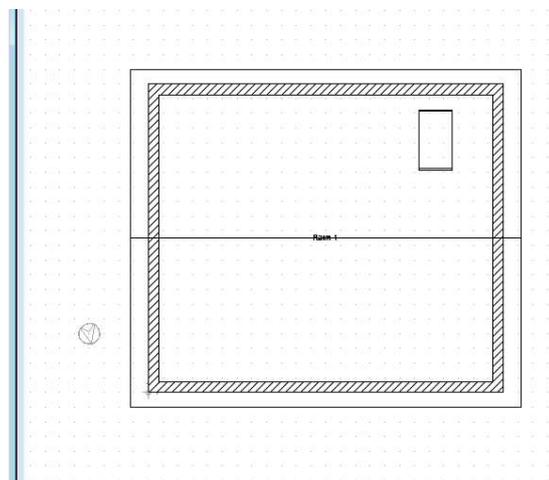
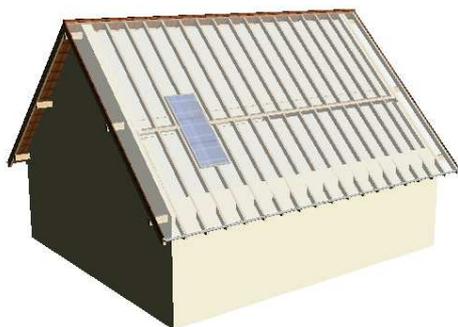


If the PV model that you want to use is not in the list then choose a model that is similar to the one you want to use, and then modify the properties. You can also add your own favourite PV modules, which will be explained later.

## 2.4.2 *Placing single solar modules*



You can place individual PV modules using the **Solar Element – Free Positioning** tool in the **Roof and Dormer** group in the **Building** tab. After changing the properties of the module you can place the module in either the 2D or 3D view. You can see the chosen module with the real sizes as preview.

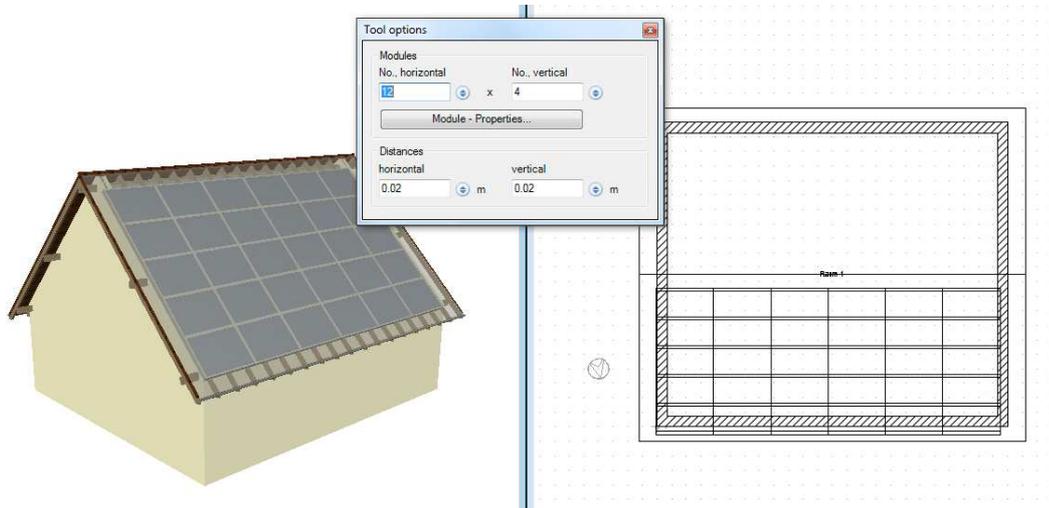


# Visual Building Solar Planning User Manual

## 2.4.3 *Placing several solar modules in a grid*



You can also place arrays of PV modules using the **Solar Element – Insert on Grid** tool in the **Roof and Dormer** group in the **Building** tab.



While the modules are attached to the mouse, you can change the reference points with Ctrl+W key combination. When the modules are placed, you can then make changes on each individual module

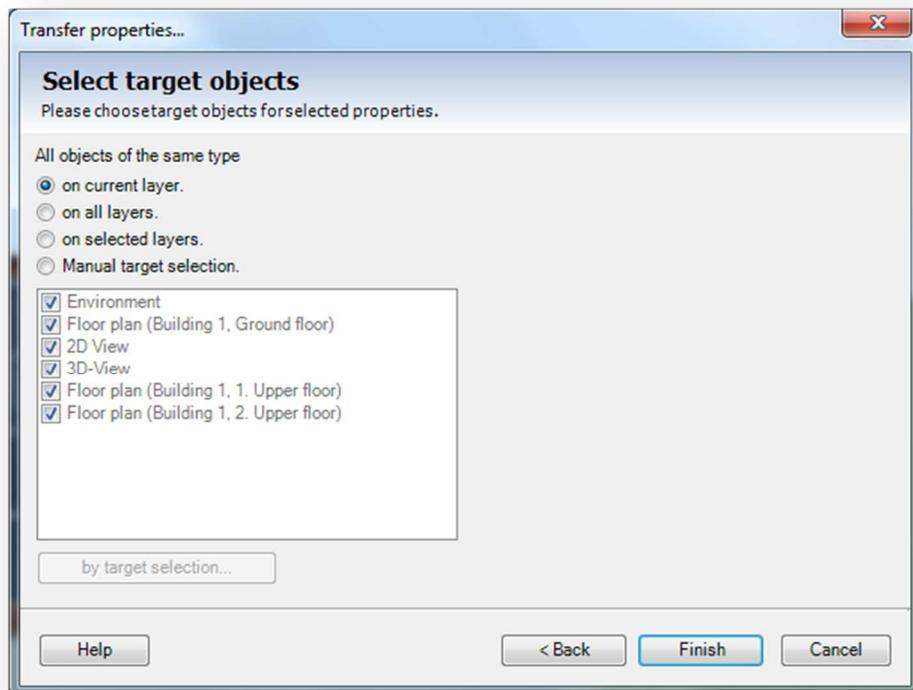
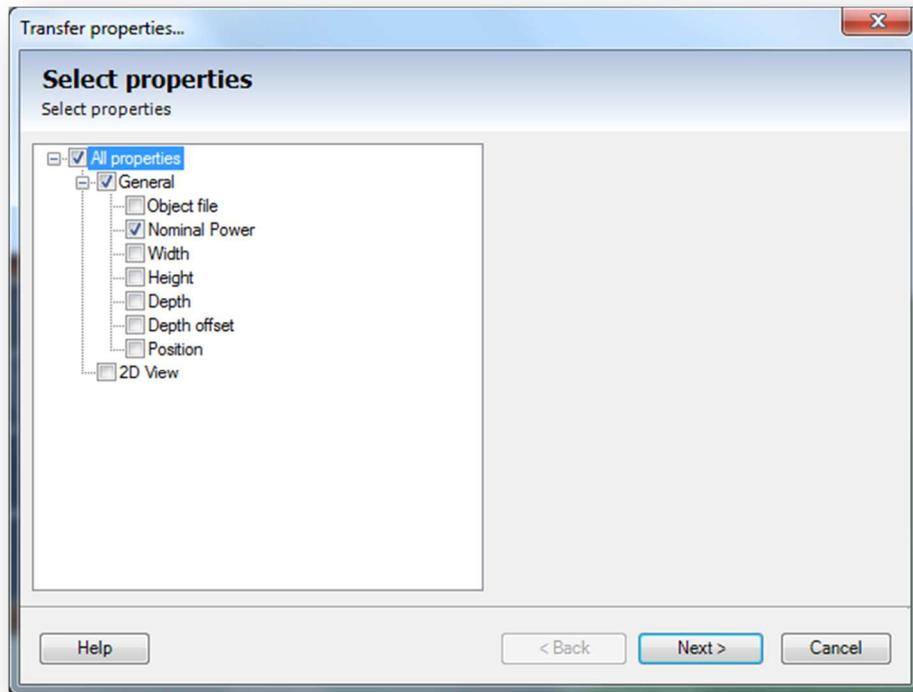
## 2.4.4 *Later Changes of the nominal power and other properties*

If you want to change the nominal power of all the PV modules, for example to find the best system for your project, you can use the function **Transfer properties** from the context menu. To activate the context menu select a PV module in either the 2D or 3D view and then right click on it.

See the steps below:

- Select a module and open the properties dialog with a double click or via the context menu
- Change the nominal power or any other property
- Close the properties dialog with **OK**
- Select the module with the changes and choose **Transfer properties** from the context menu
- Choose the changed property, for example the nominal power from the dialog
- Then choose the area or layer where you want to apply the transfer of properties to

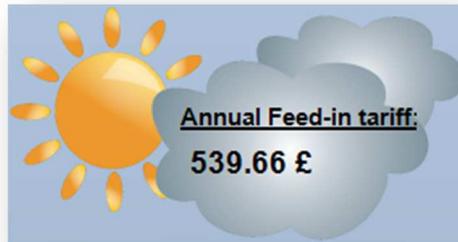
# Visual Building Solar Planning User Manual



# Visual Building Solar Planning User Manual

## 2.5 PV UNIT ANALYSIS

You can open the dialog for the analysis of the system by clicking on the **PV unit Analysis in the Ribbon bar** or double click on the info window:

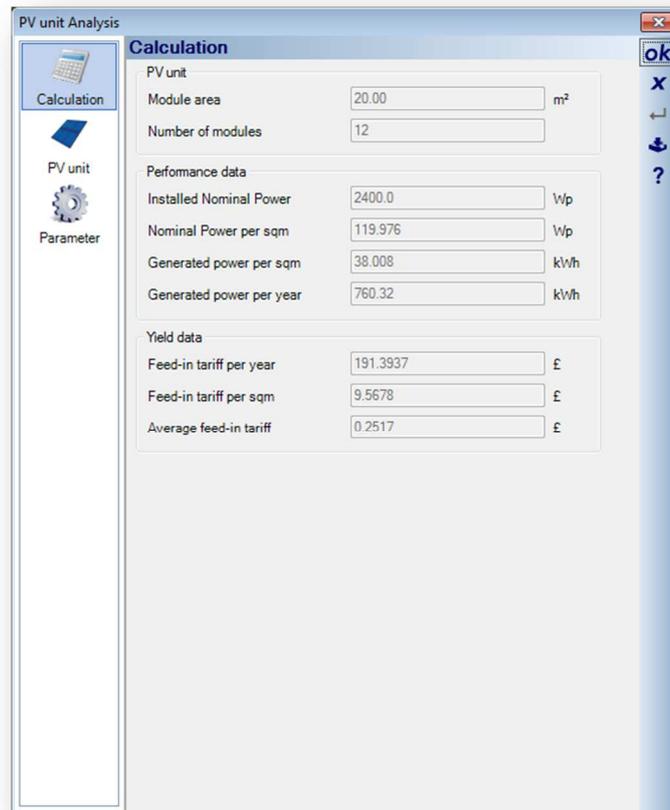


### 2.5.1 Calculation tab

The values for the solar gain etc. are calculated and displayed in the Calculation tab. You can see the number of modules you have placed and the total area.

Then the performance data is displayed showing Installed Nominal Power, Nominal Power per sq m, Generated Power per sq m and Generated Power per year.

# Visual Building Solar Planning User Manual



## Module Area

Calculated from **Panel Width x Panel Height x Number of Modules**

The **Panel Width x Panel Height** are derived from the dimensions entered into the panel object.

In the report generator this value is represented by the **Module\_Area** variable

## Number of Modules

The **Number of modules** is derived from the number of panels placed on the roof.

In the report generator this value is represented by the **Number\_of\_Modules** variable

## Installed Nominal Power

Calculated from **Nominal Power x Number of Modules**

The **Nominal Power** is derived from the value entered into the panel object.

## Nominal Power per m<sup>2</sup>

Calculated from **Installed Nominal Power / Number of modules**

In the report generator this value is represented by the **Nominal\_Power\_total** variable

## Generated Power per m<sup>2</sup>

Calculated from **Generated power per year / Area of solar modules**

In the report generator this value is represented by the **Generated\_Power\_per\_sqm** variable

# Visual Building Solar Planning User Manual

## Generated Power per year

Calculated from **Installed Nominal Power** x **Power Yield per year**

In the report generator this value is represented by the **Generated\_Power\_per\_year** variable

## Feed-in tariff per year

In the report generator this value is represented by the **Feed\_on\_tariff\_sqm** variable

## Feed-in tariff pr m<sup>2</sup>

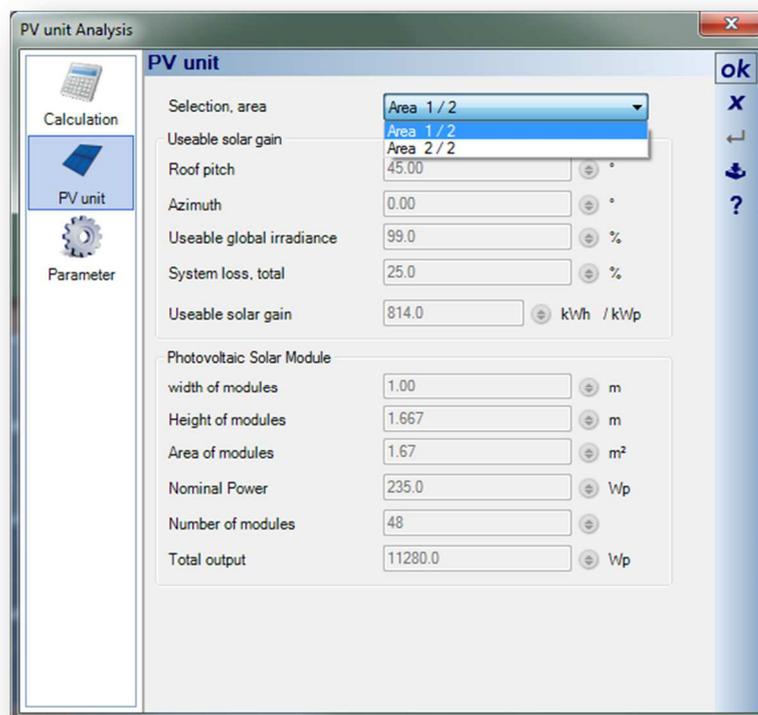
In the report generator this value is represented by the **Feed\_on\_tariff\_per\_year** variable

## Average feed-in tariff

In the report generator this value is represented by the **Average\_Feed\_in\_tariff** variable

## 2.5.2 PV Unit tab

If you have several roof surfaces with PV modules you can choose each area from the drop down list field. For each area the data will be shown. (Pitch, azimuth and solar gain)



## Selection Area

In some projects you may need to define several arrays, possibly on different roof surface with different orientation and pitches. This drop down list allows you to select the different areas that the information on this dialog refers to. Normally there is only a single array and so this is Area 1 / 1

# Visual Building Solar Planning User Manual

## **Roof Pitch**

The **Roof pitch** value is used to calculate the **Useable solar gain**. Nominally set to 30 degrees. (The optimum tilt relative to a horizontal surface of a solar panel at 1200 on either equinox is calculated as equal to your latitude. An optimum tilt value for winter can be adjusted by -15 degrees.)

## **Orientation**

This value is determined by the compass. When the roof surface faces South the orientation is 0, when facing North the orientation is 180 and when facing either West or East the orientation is 90. The **Orientation** is used to calculate the **Useable solar gain**.

A 30 degree pitch West or East facing roof drops the **Useable solar gain** to 82% of a South facing roof., and a 30 degree pitch North facing roof surface roof drops the **Useable solar gain** to 61% of a South facing roof.

A 45 degree pitch West or East facing roof drops the **Useable solar gain** to 77% of a South facing roof., and a 45 degree pitch North facing roof surface roof drops the **Useable solar gain** to 47.5% of a South facing roof.

## **Useable Global irradiance**

This value is determined by roof pitch and orientation and is nominally 100% for a south facing roof at a 30 degree pitch.

## **System loss**

The System loss is calculated from the **Efficiency of the inverter** and the **Common losses**

## **Useable solar gain**

This is calculated from the **Power yield per year** less system losses

## **Width of modules**

The width of a single module unit. This value is derived from the dimensions entered into the panel object.

## **Height of modules**

The width of a single module unit. This value is derived from the dimensions entered into the panel object.

## **Area of modules**

The area of a single module unit

## **Nominal Power**

The **Nominal Power** is derived from the value entered into the panel object for the solar module used on this specific roof surface

## **Number of modules**

This value is derived from the number solar modules placed on this specific roof surface.

## **Total output**

Calculated from Solar module **Nominal Power** x **Number Panels**

# Visual Building Solar Planning User Manual

## 2.5.3 Parameter tab

### Country

First you must select the correct country in order to load the correct feed in tariffs.

### Power Yield Per Year

You have to define the global irradiation for your area. This value can be sourced in different ways. (Internet, EU documentation) or selecting from the map using the **Select by position** button.

When using the map the tooltip of the cursor displays the values while you move the mouse over the map.

### System loss

System losses influence the solar gain. You can get the information about the efficiency of the inverter from the manufacturer. The estimated availability is used for system defects like power failure etc.

Conduction losses are included as well.

The screenshot shows the 'Parameter' tab in the 'PV unit Analysis' software. The interface is organized into a sidebar on the left and a main parameter configuration area on the right. The sidebar contains icons for 'Calculation', 'PV unit', and 'Parameter' (which is currently selected). The main area is titled 'Parameter' and contains the following fields:

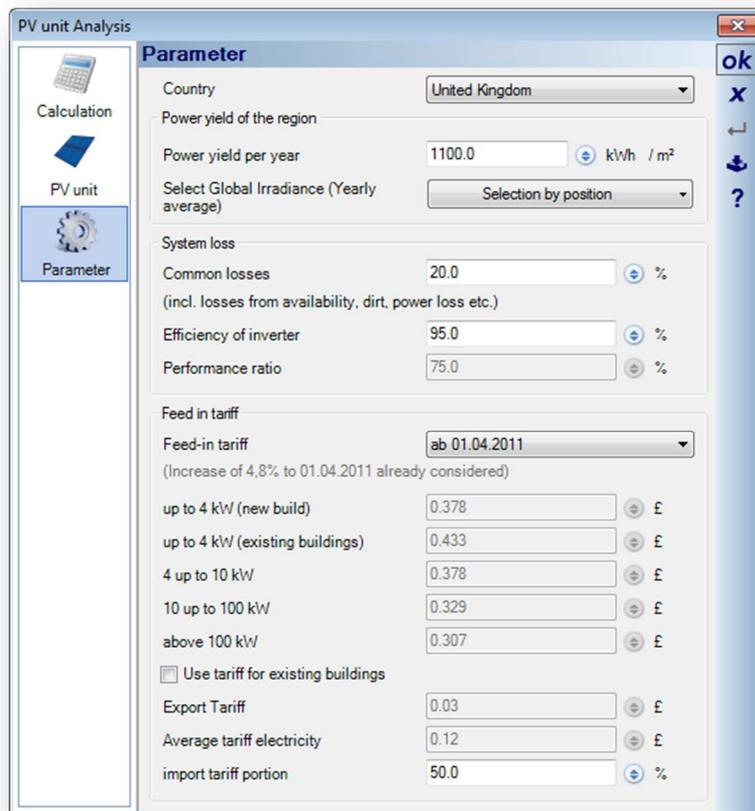
- Country:** A dropdown menu set to 'United Kingdom'.
- Power yield of the region:** A text input field.
- Power yield per year:** A text input field containing '1100.0' with the unit 'kWh / m<sup>2</sup>'.
- Select Global Irradiance (Yearly average):** A dropdown menu set to 'Selection by position'.
- System loss:** A section containing three sub-parameters:
  - Common losses:** A text input field containing '20.0' with a '%' sign.
  - Efficiency of inverter:** A text input field containing '95.0' with a '%' sign.
  - Performance ratio:** A text input field containing '75.0' with a '%' sign.
- Feed-in tariff:** A section containing:
  - Feed-in tariff:** A dropdown menu set to 'Higher Rate to 30.09.2013'.
  - EPC Band D or better:** A dropdown menu set to 'Higher rate'.
  - Rating:** A dropdown menu set to 'Higher rate'.
  - up to 4 kW:** A text input field containing '0.1701' with a '£' sign.
  - 4 up to 10 kW:** A text input field containing '0.1701' with a '£' sign.
  - 10 up to 50 kW:** A text input field containing '0.1541' with a '£' sign.
  - 50 up to 100 kW:** A text input field containing '0.1435' with a '£' sign.
  - 100 up to 150 kW:** A text input field containing '0.1267' with a '£' sign.
  - 150 up to 250 kW:** A text input field containing '0.8759' with a '£' sign.
  - 250 kW up to 5 MW:** A text input field containing '0.8759' with a '£' sign.
- Export Tariff:** A text input field containing '0.8759' with a '£' sign.
- Average tariff electricity:** A text input field containing '0.8759' with a '£' sign.
- import tariff portion:** A text input field containing '100.0' with a '%' sign.

# Visual Building Solar Planning User Manual

## Feed in tariff

The feed in tariff rates are updated periodically and are defined from a xml data file called solarConfig.XML located in the following path:

C:\Program Files\Visual Building Solar Designer\Program\en-GB\solarConfig.xml



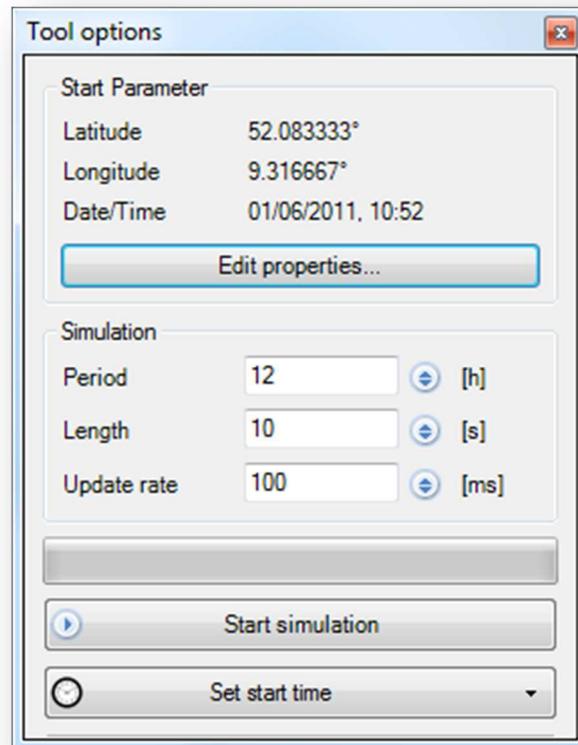
The screenshot shows the 'PV unit Analysis' dialog box with the 'Parameter' tab selected. The dialog is divided into several sections:

- Country:** United Kingdom (dropdown menu)
- Power yield of the region:** (empty field)
- Power yield per year:** 1100.0 kWh / m<sup>2</sup> (spin box)
- Select Global Irradiance (Yearly average):** Selection by position (dropdown menu)
- System loss:**
  - Common losses:** 20.0 % (spin box)
  - (incl. losses from availability, dirt, power loss etc.)
  - Efficiency of inverter:** 95.0 % (spin box)
  - Performance ratio:** 75.0 % (spin box)
- Feed in tariff:**
  - Feed-in tariff:** ab 01.04.2011 (dropdown menu)
  - (Increase of 4.8% to 01.04.2011 already considered)
  - up to 4 kW (new build):** 0.378 £ (spin box)
  - up to 4 kW (existing buildings):** 0.433 £ (spin box)
  - 4 up to 10 kW:** 0.378 £ (spin box)
  - 10 up to 100 kW:** 0.329 £ (spin box)
  - above 100 kW:** 0.307 £ (spin box)
  - Use tariff for existing buildings
  - Export Tariff:** 0.03 £ (spin box)
  - Average tariff electricity:** 0.12 £ (spin box)
  - import tariff portion:** 50.0 % (spin box)

## 2.6 SHADING SIMULATION

With the button  in the tool bar you can activate the shading simulation. With the tool dialog you can control the simulation.

# Visual Building Solar Planning User Manual



First you define the location and the time. You define the period and time of the simulation.

With the button **Start simulation** you can start and stop the simulation.

You are able to use a time from a list below if you want to repeat a simulation.

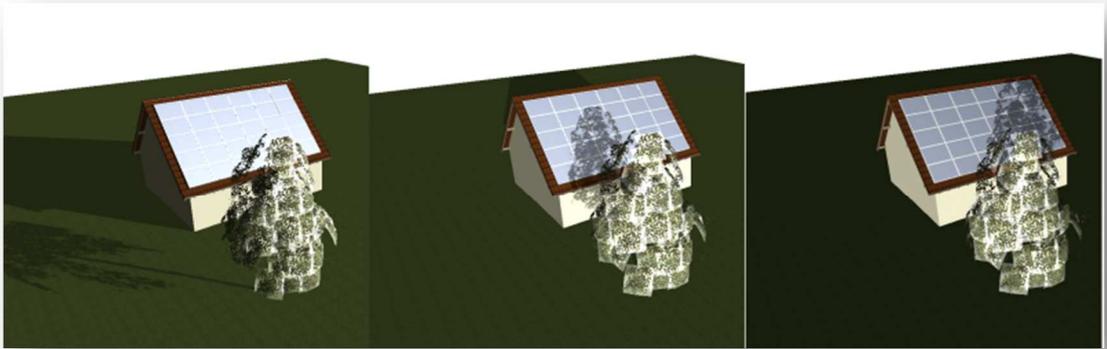
You can delete entries by using the Del button, if the entry is selected.

In the simulation you can see the shadows over the period you defined. So you can check if you have any problems with shading on your PV modules. You are able to define all environmental items in detail, and can change the sizes of trees, adjacent buildings etc.

See the example with 2 same positions on the 1st of September and the 31st of December.



# Visual Building Solar Planning User Manual



## 3 CREATE A NEW SOLAR PANEL

### 3.1 CREATE NEW PANEL

Before you start, you will need the following details concerning your new solar panel:

Product Name

\*Product web link

Manufacturer's name

\*Manufacturers web link

\*PDF specification file

Panel external dimensions (width x height x depth in cm)

Panel Nominal Power

\*Additional text information you want to display about the panel

\*Additional popup image you want to display about the panel

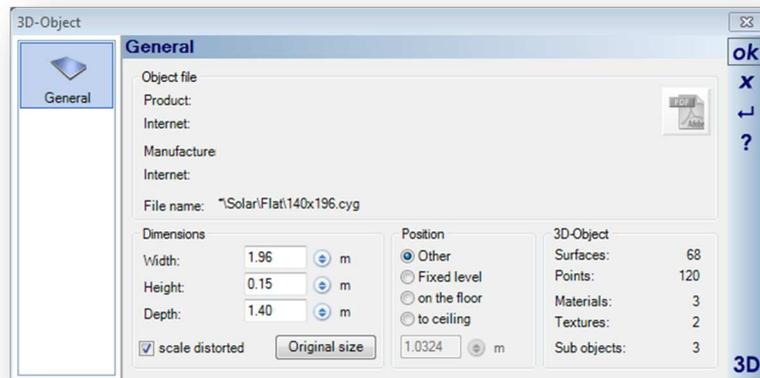
\*Optional

1. Create a new project (Ctrl + N)
2. Create a 3D View of this new project (Alt+W, N), and arrange the windows vertically so you can view both windows.
3. In the catalog, select Construction element from the top catalogue icon bar, then select the Solar modules catalogue folder
4. From the catalogue select any panel, and drag it into a new project (either into the 2D or 3D view) while holding down the Ctrl key down.

Right click on the solar panel object and select properties.

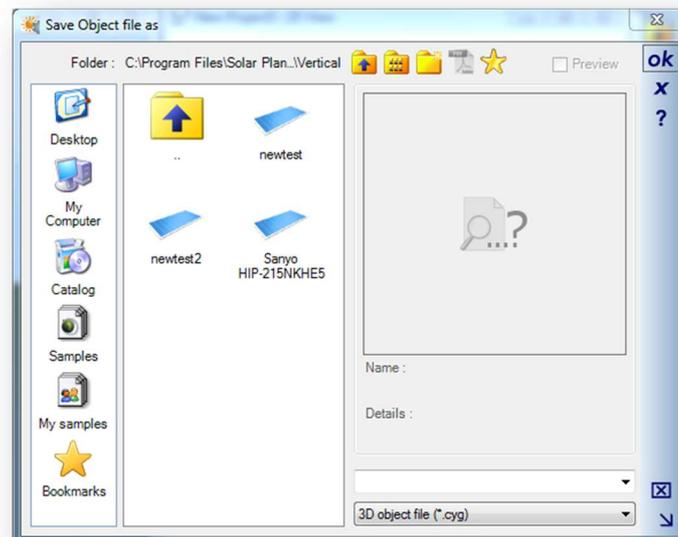
You will see the existing properties for the existing panel, which we are now going to edit.

# Visual Building Solar Planning User Manual



5. In the 3D Object Properties panel select the **Scale distorted** checkbox and adjust the **Width, Height** and **Depth**. Click **OK** to accept the edits.
6. Select the panel object in the 3D view, and then press Alt + x, 3, Return (selecting the Export menu, 3D formats, 3D Object file).

This will activate the Save Object file as... dialog.

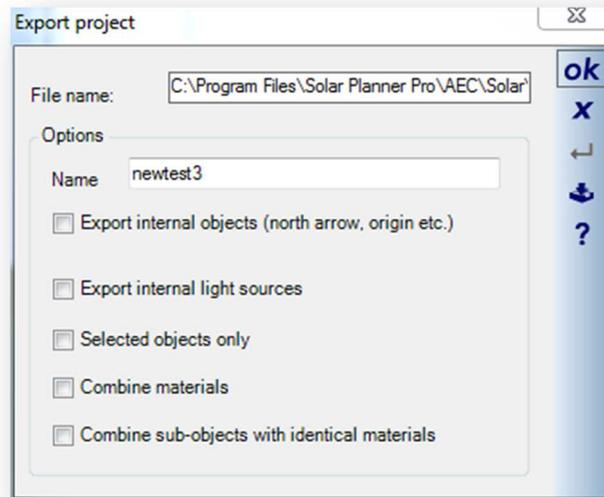


In this dialog navigate to Catalog/AEC/Solar Elements/Solar modules and navigate to the manufacturer's folder. (You can create a new folder for a manufacturer by selecting **Create New Folder...** in the top of this dialog, and then entering the Manufacturer's name.)

# Visual Building Solar Planning User Manual

Enter the file name for your new panel, and select **OK**

The Export project is activated.



Select the following Checkbox:

- Selected objects only**
- Combine materials**
- Combine sub-objects with identical materials**

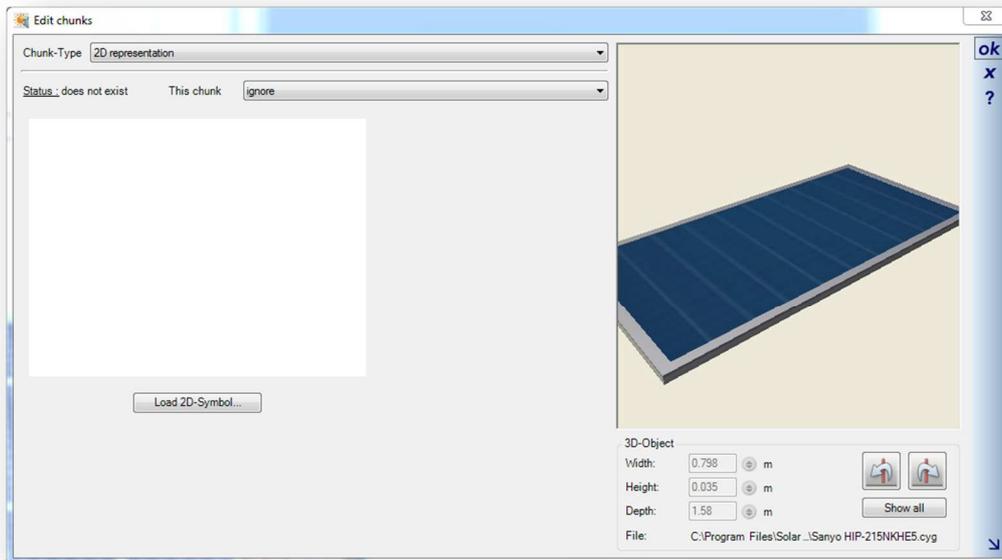
Add or edit the Name. This is the name that will appear in the catalog, not the file name.

Select **OK** and the solar panel will be added to the Catalog.

You will need to navigate up and down a level in the catalog to refresh the contents to view the new panel object.

7. In the Catalog tab, select **Construction Elements**
8. In the catalog select **Solar modules**, and navigate to where you just saved you new panel object.
9. Locate your new solar panel and right click on it to activate the context menu, and select **Edit Chunks**.  
This will activate the Edit Chunks dialog:

# Visual Building Solar Planning User Manual



10. From the ChunkType drop down list, select **Common information**

Select **This chunk** drop down list to **Add or replace**. This is important otherwise your changes will not get saved.

### **General Section**

Ensure Object type is set to Solar element 3D-Object

### **Product Section**

This data will appear in the product information panel

### **Manufacturer Section**

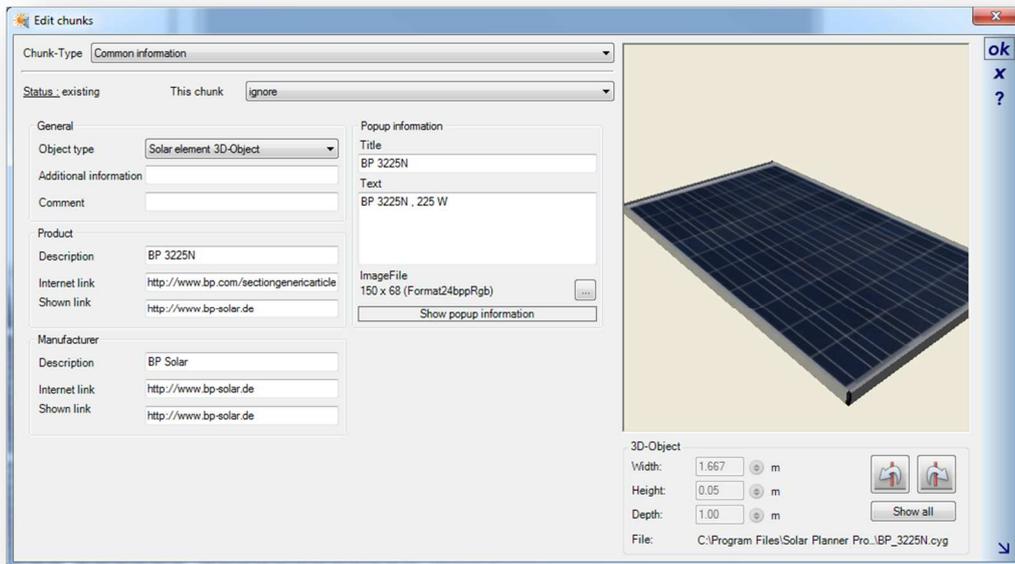
This data will appear in the product information panel

### **Popup Information Section**

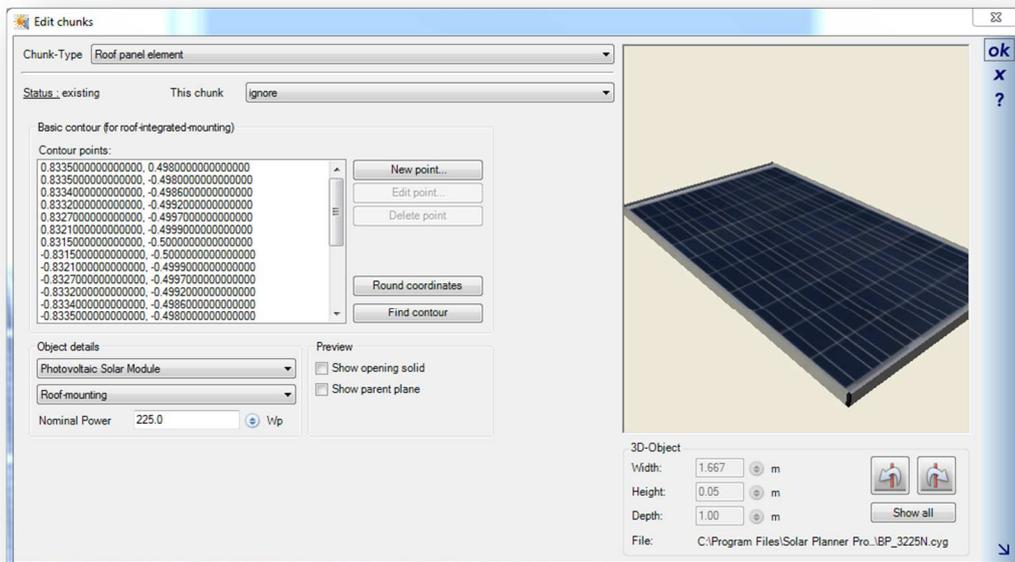
This data will appear in the product information panel

The image file will appear as a pop up when mouse cursor hovers over object

# Visual Building Solar Planning User Manual



11. From the ChunkType drop down list, select **Roof panel element**



Select **This chunk** drop down list to **Add or replace**.

The Contour points are used only for roof integrated mounting. This is ignored for Roof surface mounting.

If your panel is roof integrated, then select **Object details** to **Roof integrated mounting**.

You should also specify if your panel is a **Photovoltaic Solar Module** or a **Solar Thermal Collector**

# Visual Building Solar Planning User Manual

For a **roof integrated mounting**, enable the **Preview** option **Show opening solid**, as this will then show the area defined by the contour points. The **Show parent plane** will display the roof plane in the preview window. The contour points are the area around the panel that is cut away into the roof. The points can automatically be generated by clicking on the **Find contour** button. The **Round coordinates** will round the calculated values to 4 decimal places. You can edit individual points by selecting a point and selecting **Edit point**. The result of the edit is displayed in the preview window

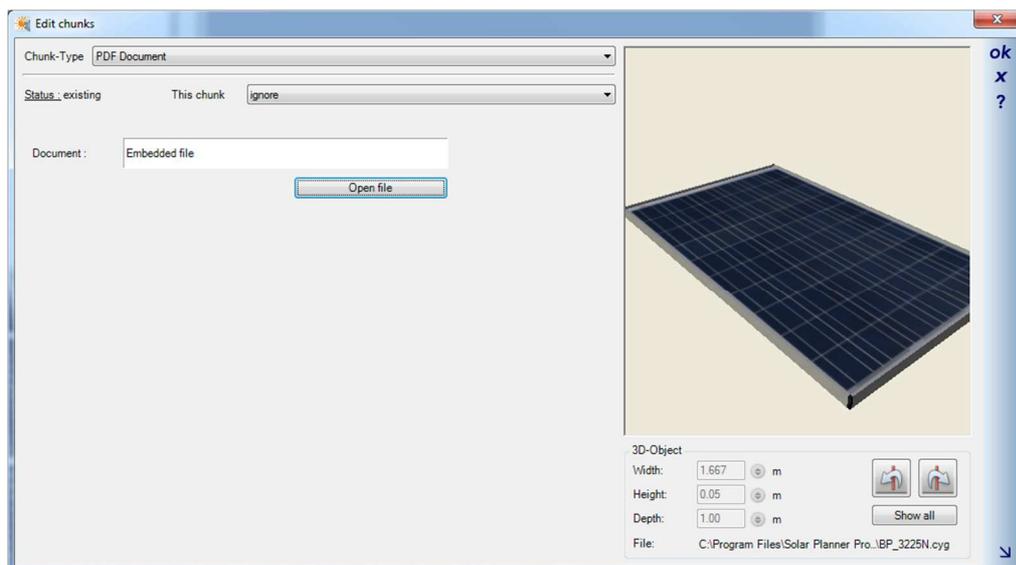
**IMPORTANT:** Add the **Nominal Power for** this panel. This is an important value as it is used in the output calculations.

12. From the ChunkType drop down list, select **PDF Document**

Select **This chunk** drop down list to **Add or replace**.

Select the pdf document via Open File button.

You can attach a pdf file to the object. This pdf would normally contain additional product specifications.



13. Finally select **OK** to save the edits

You have now created a new Solar Panel object.

14. You can allocate a icon to a new manufacturers folder by right clicking on the folder to activate the **Properties** context menu

# Visual Building Solar Planning User Manual



You can edit the folder name.

You can load an image file to be used as an icon, by clicking on the image file. We recommend using a 128x128 image with a white background.

## 3.2 CREATE COPY OF EXISTING PANEL

The previous section creates a new panel without retaining any of the original panel's values. If you are creating a range of panels with mostly the same values this can become tiresome.

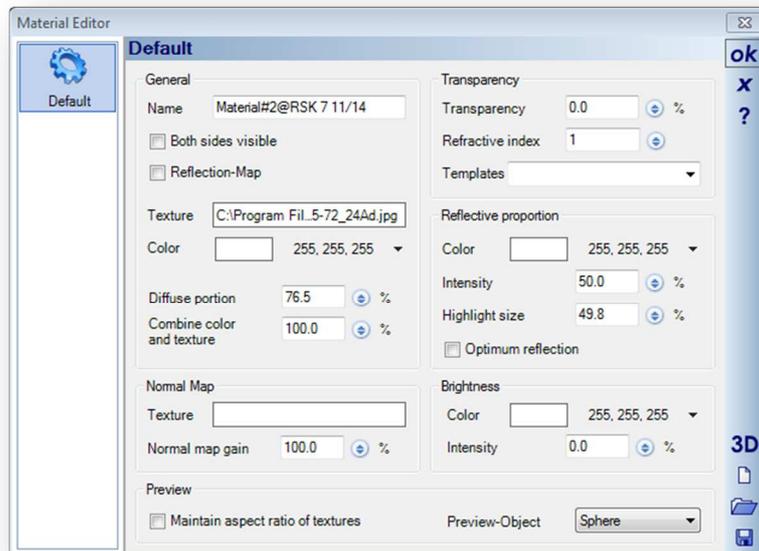
You can also use an existing solar panel module and reproduce it several times replacing only the specifications that differ. For example a range of panels may have the same specifications and only the power output is different. The dimensions and the web links, and .pdf file all remain the same.

1. Copy the panel giving it a new file name (in windows explorer)
2. Use the **ChunkEditor** to edit the panels name and power
3. You will see that although you have a different file name, the catalogue name remains unchanged, so use the **3D Converter** to rename the catalogue name. **Run 3D Converter**
4. In the top file navigation window, navigate to the object you want to edit and load the object by selecting it.
5. In the bottom left properties panel, you can edit the Name and web links, and dimensions

# Visual Building Solar Planning User Manual

<b>Document</b>	
Document	
Existing	False
<b>File</b>	
File name	C:\Program Files\Visual Building Solar Designer\AEC\Solar\Flat\Su
File size	13145
<b>Information</b>	
Manuf	www.suntech-power.com
Manufacturer - URL Text	www.suntech-power.com
Manufacturer Url	http://www.suntech-power.com
Product - Url	http://www.suntech-power.com
Product - Name	Suntech
Product - shown URL	www.suntech-power.com
<b>Properties</b>	
Depth	1.58
Height	0.035
Insert	Other
Level	-0.22499979957938193
Name	STP 190S-24AD+
Width	0.808
<b>Scaling</b>	
X-Scale	100
Y-Scale (%)	100
Z-Scale (%)	100
scale distorted	False

6. You can change the texture image of the panel by selecting the object centre texture and then activating the Material editor with the **Edit material** icon



7. Select a new texture using the Texture field and then click OK
8. Then click on Save Object icon to save your edit panel object

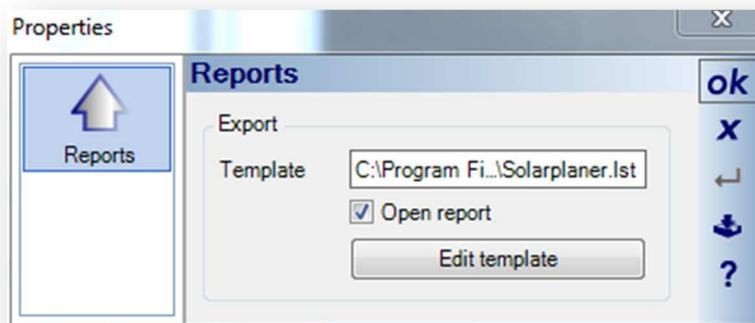
# Visual Building Solar Planning User Manual



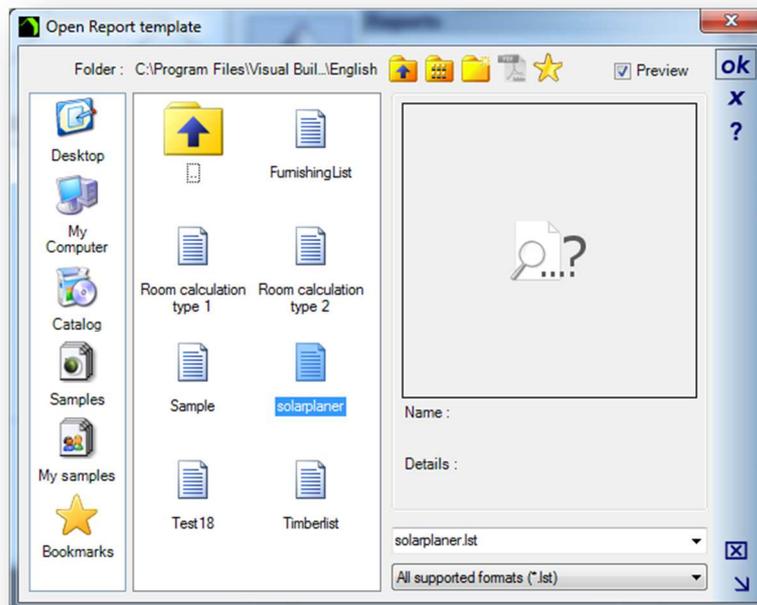
## 4 REPORTS

### 4.1 RUNNING A REPORT

Reports are run from the menu: Export/Reports/Reports/Solar Analysis menu and activates the Properties dialog:

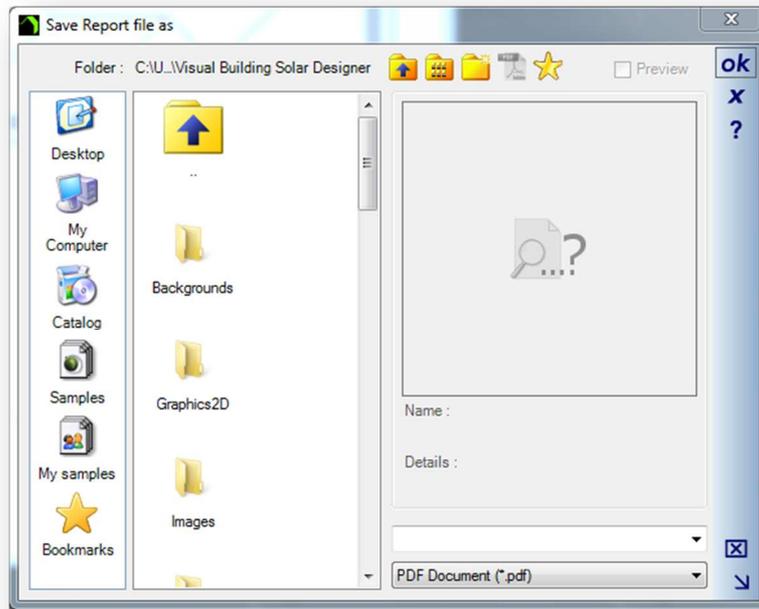


To select a report click on the Template path field. To activate the Open Report Dialog:



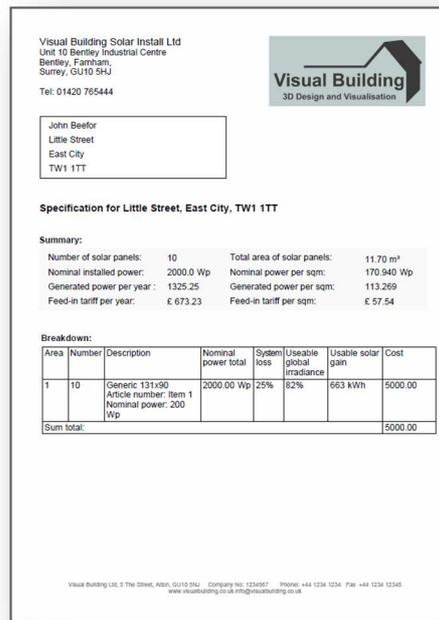
# Visual Building Solar Planning User Manual

All reports are .lst files and care must be made to select only reports related to Solar panels, as reports for other parts of the system also reside here. We suggest you prefix all reports names associated with the Solar Designer with Solar, eg SolarEstimation1.lst. You could also create a new folder to save your Solar reports into. To run the report select a report and then click OK. The Save Report dialog then appears:



This dialog is prompting you for a file name (default is .pdf, but alternative file types are html,xls and .rtf). The report is then displayed:

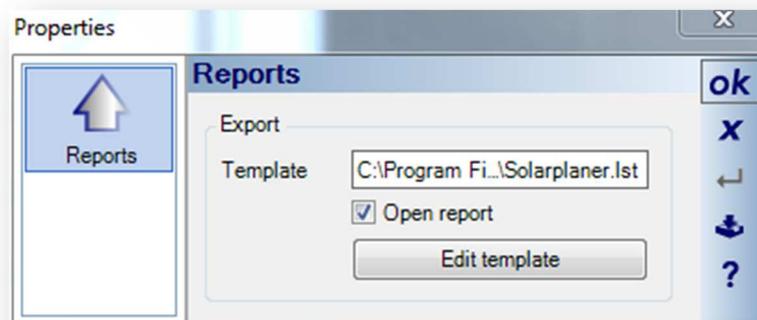
# Visual Building Solar Planning User Manual



Note, if the report fails to display, please ensure that your pdf presentation program (eg Adobe Reader) is not already actively showing a report.

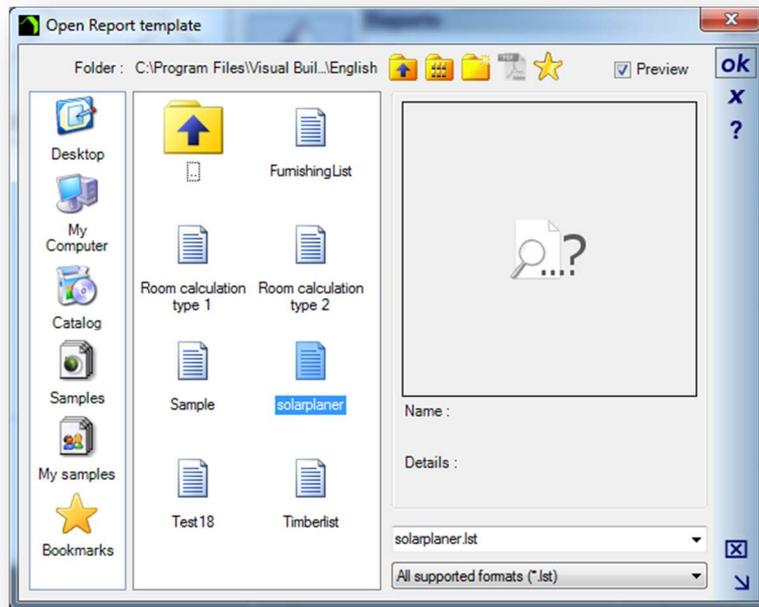
## 4.2 EDITING A REPORT

Reports are edited from the menu: Export/Reports/Reports/Solar Analysis menu which then activates the Properties dialog:



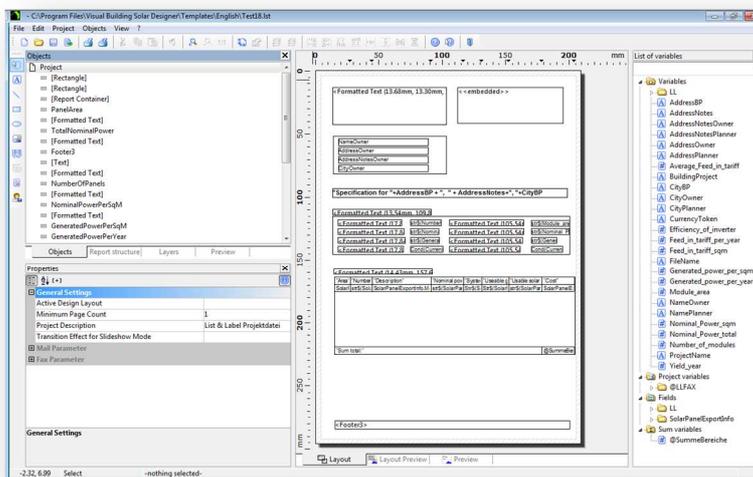
To select a report, click on the Template path field. To activate the Open Report Dialog:

# Visual Building Solar Planning User Manual



Select the report to be edited and the select OK.

Now click on Edit Template, which will then activate the List & Label program, the report template editor.



## Overview of List & Label:

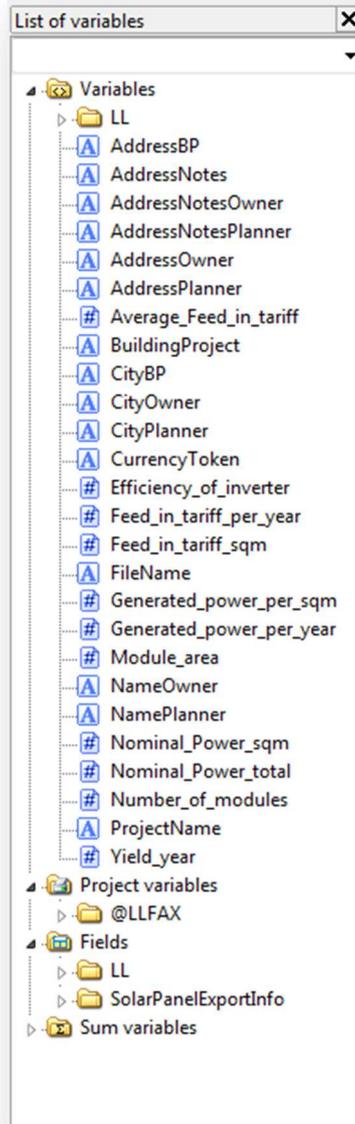
### Object List Window

This where you create your objects to be displayed within your report (default left hand window)

### Variable List Window

# Visual Building Solar Planning User Manual

This window contains all the variables visible to List & Label. (default left hand window)



## Layout Window

This is where you will place your objects to be displayed. (default centre window). This window also contains Layout Preview and Preview tabs.

# Visual Building Solar Planning User Manual

## 4.3 CREATING A NEW REPORT

Normally it's easier to edit an existing report, rather from starting with a blank report, especially as most of your reports will contain the same variables, but with different calculations and layout.

If you do want to create a new blank report, then after loading an existing report, click on **File / New** (Alt + F, N). You should then save the new report template, to be sure not to overwrite the report that you loaded, using **File/Save As** menu (Alt + F, A) .

Be sure to save the file in:

C:\Program Files\Visual Building Solar Designer\Templates\English

### 4.3.1 Create a logo

For your company logo, please use a .gif or .png file. We also need to create a "Picture" object. Proceed as follows:

- a) In the "Objects" toolbar, choose the "Picture" object type.
- b) In the workspace, point the mouse to the position where the upper left corner of the object is to begin. The mouse cursor changes to a crosshair. Hold down the left mouse button and drag the crosshair to the lower right corner of the planned object. Release the mouse button when the object (the dashed border) is the right size.
- c) A file selection dialog will appear. Select the image file that you want.
- d) After you select the file, the logo will be inserted. In addition, you can insert the picture into the project by enabling the ("Embed image in project file" checkbox option. This option copies the image to the project thus making it available even without the external file.
- e) In the Properties panel, you can change the objects properties, such **Keep proportions**, and **Position**.

So you have now created your first object in your report! You can view the logo by clicking on the Preview tab.

### 4.3.2 Add a Text Label

You can use a text object to add a title to the report. Text objects let you place text in the workspace. As well as fixed text, you can also insert the contents of fields (variables) from the database (e.g. company name), or you can use functions (page number, date etc.).

- a) In the "Objects" toolbar, choose the "Text" object type.
- b) In the workspace, hold down the left mouse button and pull the object to the required size.

# Visual Building Solar Planning User Manual

- c) The formula wizard will now appear which you can use to define the contents of the text object.
- d) This dialog consists of a series of tabs each containing different elements to be edited. The following chapters explain the meanings of these elements in more detail.
- Variables and Functions: the available variables, fields and functions.
  - Condition: for defining IF-THEN-ELSE conditions.
  - Text: for entering fixed text and tabs.
  - Date Format: different date formats.
  - Number Format: different number formats.
  - Operators: available conjunction operators.
- e) You can also enter the expression that you want directly in the edit box or modify the text that is there (e.g. put something in brackets). Therefore, enter our title "List of products" directly. Fixed text must be enclosed in quotation marks. Enter names of variables and functions without brackets.

## 4.4 REPORT DATA SOURCES

Reports are based on data coming from the following sources:

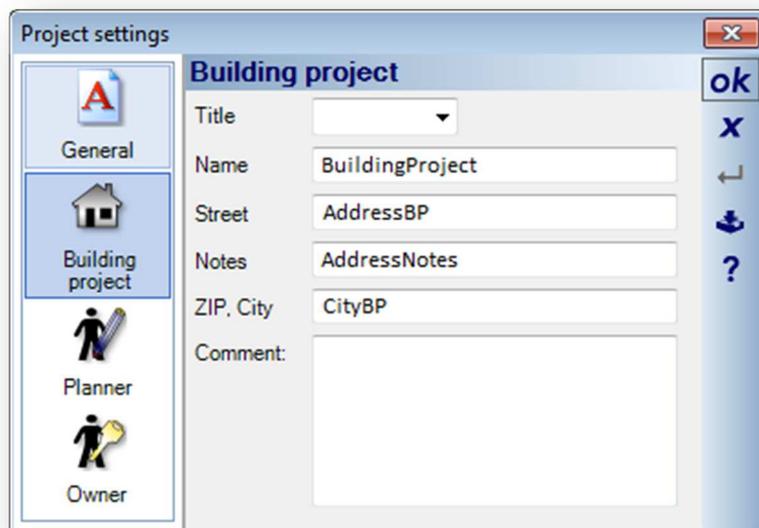
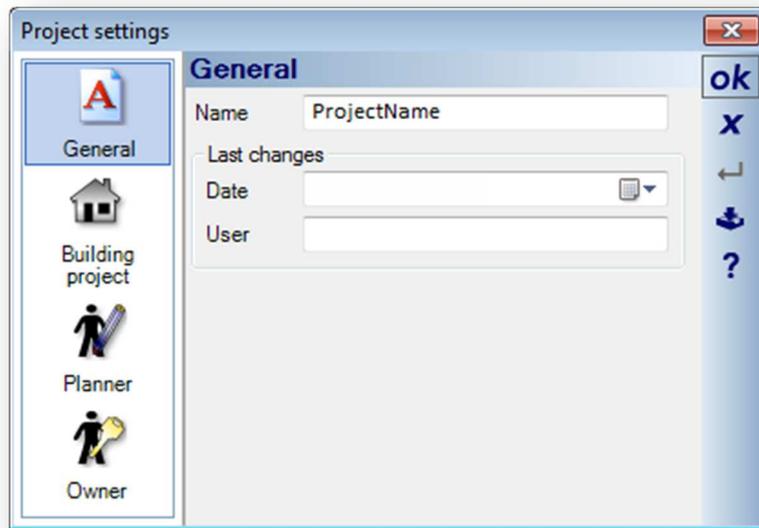
- a) Project name and address properties
- b) Calculated values
- c) The solar panel object
- d) The solar data file

### 4.4.1 *Project name and address properties*

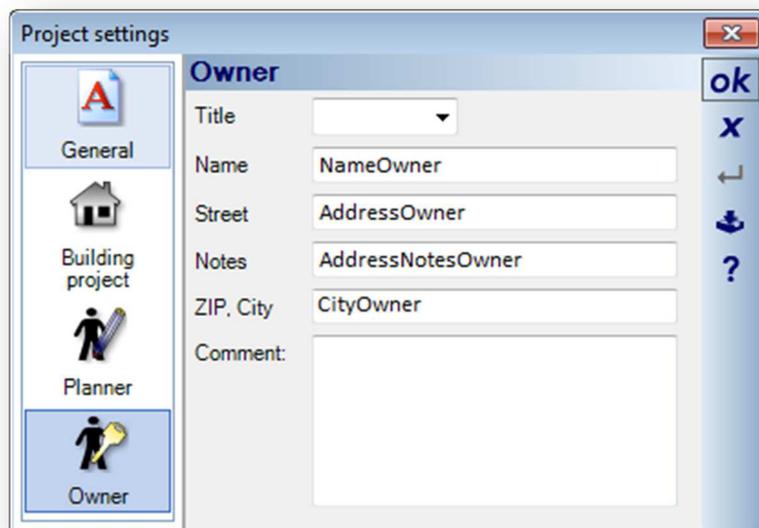
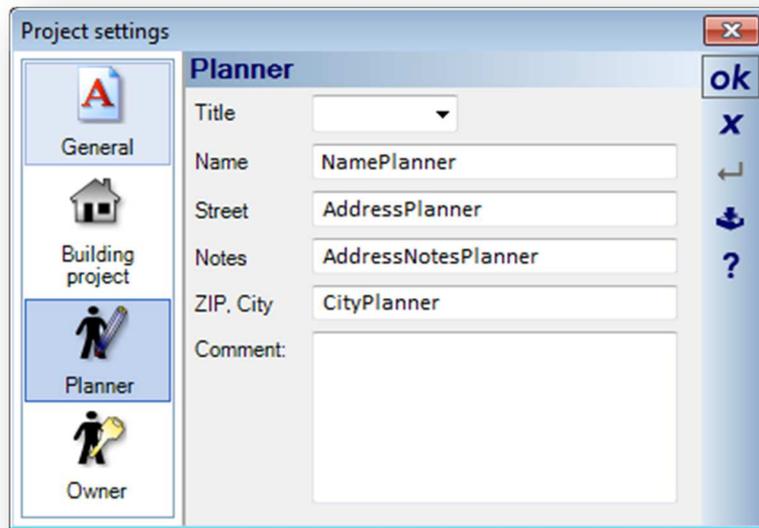
The following variables are generated from the name and address details entered in the Project settings dialog.

NameOwner
AddressOwner
AddressNotesOwner
CityOwner
NamePlanner
AddressPlanner
AddressNotesPlanner
CityPlanner
BuildingProject
AddressBP
AddressNotes
CityBP
ProjectName

# Visual Building Solar Planning User Manual



# Visual Building Solar Planning User Manual



## 4.4.2 *Calculated values*

These values are calculated and displayed in the PV unit Analysis function:

# Visual Building Solar Planning User Manual

Average_Feed_in_tariff
Efficiency_of_inverter
Feed_in_tariff_per_year
Feed_in_tariff_sqm
Generated_power_per_sqm
Generated_power_per_year
Module_area
Nominal_Power_sqm
Nominal_Power_total
Number_of_modules
Yield_year

Note that some of these values are calculated from values derived from the actual object:

- Panel Nominal Power
- Panel dimensions

## 4.4.3 *The solar data file*

The data file is a CSV list of additional properties for each solar panel. The list is called Solar.csv and is located in:

C:\Program Files\Visual Building Solar Designer\Templates\English

And appears in the following format:

```
Datei;Bezeichnung;Artikelnummer;Beschreibung;#. #Preis  
140x113.cyg;Mein Modul;Test Panel;Meine Beschreibung;123.45  
YL185P23b.cyg;YL 185 P23b;YL185;Solar Panel;500.00  
131x90.cyg;;;500.00
```

The first line contains the data variable names that are imported into the report generator. Each variable is separated by a semi-colon.

## 5 FEED IN TARIFF DATA FILE

The feed in tariff rates are updated periodically and are defined from a xml data file called solarConfig.XML located in the following path:

C:\Program Files\Visual Building Solar Designer\Program\en-GB\solarConfig.xml

If you want to edit your own, you need only be concerned with the xml block <Category ItemName="GB">

The xml block <Category ItemName="MapValues"> relate to the power generation derived when clicking on the map, and these have not changed and so should not be changed.

The xml block <Category ItemName="Reimbursement"> is the place where we keep the FIT data.

Within this block there are 3 xml blocks:

```
<Category ItemName="2014-04-01">
<Category ItemName="2014-07-01">>
<Category ItemName="2014-10-01">
```

If this is now historical data it can be ignored. (In fact in the download file we have removed the historical data to avoid chance of selecting old tariff and creating wrong data.

```
<Category ItemName="Reimbursement">
  <Category ItemName="2014-04-01">
    <Option ItemName="Name" ValueType="21">From 01.04.2014</Option>
    <Option ItemName="Comment" ValueType="21"></Option>
    <Option ItemName="Level0" ValueType="6">0.1438</Option>
    <Option ItemName="Level1" ValueType="6">0.1303</Option>
    <Option ItemName="Level2" ValueType="6">0.1213</Option>
    <Option ItemName="Level3" ValueType="6">0.1071</Option>
    <Option ItemName="Level4" ValueType="6">0.1071</Option>
    <Option ItemName="Level5" ValueType="6">0.1025</Option>
    <Option ItemName="Level6" ValueType="6">0.0661</Option>
    <Option ItemName="ExportTariff" ValueType="6">0.0477</Option>
    <Option ItemName="ImportTariff" ValueType="6">0.137005104</Option>
  </Category>
```

```
<Category ItemName="2014-07-01">
  <Option ItemName="Name" ValueType="21">From 01.07.2014</Option>
  <Option ItemName="Comment" ValueType="21"></Option>
  <Option ItemName="Level0" ValueType="6">0.1438</Option>
  <Option ItemName="Level1" ValueType="6">0.1303</Option>
```

# Visual Building Solar Planning User Manual

```
<Option ItemName="Level2" ValueType="6">0.1213</Option>
<Option ItemName="Level3" ValueType="6">0.1034</Option>
<Option ItemName="Level4" ValueType="6">0.1034</Option>
<Option ItemName="Level5" ValueType="6">0.0989</Option>
<Option ItemName="Level6" ValueType="6">0.0638</Option>
<Option ItemName="ExportTariff" ValueType="6">0.0477</Option>
<Option ItemName="ImportTariff" ValueType="6">0.137005104</Option>
</Category>

<Category ItemName="2014-10-01">
<Option ItemName="Name" ValueType="21">From 01.10.2014</Option>
<Option ItemName="Comment" ValueType="21"></Option>
<Option ItemName="Level0" ValueType="6">0.1438</Option>
<Option ItemName="Level1" ValueType="6">0.1303</Option>
<Option ItemName="Level2" ValueType="6">0.1213</Option>
<Option ItemName="Level3" ValueType="6">0.1034</Option>
<Option ItemName="Level4" ValueType="6">0.1034</Option>
<Option ItemName="Level5" ValueType="6">0.0989</Option>
<Option ItemName="Level6" ValueType="6">0.0638</Option>
<Option ItemName="ExportTariff" ValueType="6">0.0477</Option>
<Option ItemName="ImportTariff" ValueType="6">0.137005104</Option>
</Category>
</Category>
</Category>
```