

Solution 8 3 D Scene Export Procedures

Real Real

PVsyst SA www.pvsyst.com

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1 SketchUp

1.1 The 3D scene in SketchUp

It is possible to model a 3D scene in SketchUp with buildings, trees and other objects that may shade the PV modules.

First you need to define the 3D scene, for example a simple building with a 25° sloping roof.

Here are the dimensions of the example below:

- Length: 20 meters
- Width: 12 meters
- Height under roof: 6,10 meters
- Total height: 8,89 meters



Figure 1 : 3D Scene in SketchUp

Once you have drawn the structure, you can create the PV module.

For this tutorial, a 300Wp PV module is considered with the following dimensions:

- Length: 1,640 meters
- Width: 0,99 meters
- Thickness: 0,09 meters



Draw the PV module using the dimensions shown.



Figure 2 : 3D scene of a PV module in SketchUp

1.2 Defining material

After the dimensioning, it is important to define the material of the active surface of the PV module. This is created using the *Material* palette on the right of the window.



Figure 3 : Material palette in SketchUp



Click on the logo **to create a material**.

Assign it a colour and a name. Give it the colour blue and the name *PVmodule*.

③ Create Material	×
PVmodule	
Color	_
Picker: Color Wheel	
Texture	
Use texture image	
	7
↔ 0,10 m Colorize	
0,10 m	or
Opacity	_
100 🖨	
OK Cancel	

Figure 4: Create a material in SketchUp



Figure 5 : Colouring the surface of the PV module in SketchUp



1.3 Defining a component

It is important to define the PV module as a component.

Click 3 times on the drawn object.



Figure 6 : PV module selection in SketchUp



Right-click and select "Make Component"

Figure 7 : Creating a component in SketchUp





Complete the definition by giving a name (for example *modulePV300Wc*).

Figure 8 : Defining a component in SketchUp



Place a 9kWp PV array on the roof as shown in the drawing below.

Figure 9 : PV field in SketchUp



1.4 Exporting the 3D scene in SketchUp

Once the final positioning of the PV modules on the roof has been defined, you can export the 3D scene.



Click on "File" in the top left corner.

Figure 10 : Exporting the 3D scene in SketchUp

Choose "Export", then "3D Model".



Figure 11 : Exporting the 3D scene to SketchUp



PVsyst recognizes the 3DS and DAE format from SketchUp.

Choose the COLLADA(*dae) file format and save it in a folder provided for this purpose.



NB: PVsyst prefers the *DAE* format because it is an open source format dedicated to the exchange of 3D drawings.

Figure 12: Choosing the format for exporting the 3D scene in SketchUp



1.5 Importing the 3D scene into PVsyst

In PVsyst, open the DEMO Residential system at Geneva variant VC0 project.

1.5.1 Defining the 3D scene in PVsyst

To import your 3D scene into PVsyst, follow the steps below.

Click on "Near shadings" in the optional PVsyst parameters.

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				(version 0.0.0, date 10)	10/24)						
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/ariant tariant n° [Main parameters Orientation System	IC7 : First simulation	🛨 New 🖡	Save Save	Simulation	🎗 Manage	☐	esults overview System kind System Production Specific production Performance Ratio Normalized produc	ion	No 3D scene 11888 k 1321 k 0.877 3.62 k	e defined, no shadings Wh/yr Wh/kWp/yr Wh/kWp/day	
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/ariant fariant n° [Main parameters- Orientation System Detailed losses Self-consumption	IC7 : First simulation Optional I Optional I Option	adıngs layout management	Save	Import Delete -Simulation -Simulation Advanced Simulation Image Report	Manage		esults overview System kind System Production Specific production Performance Ratio Normalized produc Array losses System losses	ion	No 3D scene 11888 k 1321 k 0.877 3.62 k 0.44 k 0.07 k	¢ defined, no shadings Wh/yr Wh/Wp/yr Wh/Wp/day Wh/Wp/day Wh/Wp/day	

Figure 13 : Demo Residential project in PVsyst



Click on "Construction/Perspective".

루 Near Shadings defini	tion, Variant "First simulation"	– 🗆 X					
Near shadings 3D se	cene						
Comment	No shading scene defined						
	Construction / Perspective	Import					
		Export					
Compatibility betwe							
Orientation	tation Fixed, Tilt 25.0°, Azim. 20.0°						
	PV system 3D scene						
Number of sub-arrays	1 No 3D scene defined						
PV modules / tables are	ta 48.8 m ²						
Number of PV modules	30						
	No shadings defined for this simulation.	-Shading factors					
		Table					
		A Graph					
lice in cimulation	Calculation mode						
No Shadings	Calculation mode						
No shaungs							
O Linear shadings							
 According to module 	2 strings						
O Detailed electrical c	alculation (acc. to module layout)						
Q System overv	iew 📄 Print 🗶 Cancel	🗸 ок					

Figure 14: Close shading in PVsyst

Click on "File", "Import" and "Import a 3D scene (3DS, DAE, PVC)"

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ct Edit	Transform	View	Tools Help								
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							Z	Cenith			
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d objects	(.SHO)	CSU	Im <u>p</u> ort ground data	(CSV, TIF)				\sim			
ew.	>		Imp <u>o</u> rt a ground im	age				$\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!$			
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	Ctrl+Q	·		\sim		\searrow	\checkmark			\leq	
	Ctrl+W		\sim	>>		\sim	$\sim \!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!$			\sim	
		-			X				X		

Figure 15: Importing a 3D scene into PVsyst

Choose the file exported from SketchUp in DAE format.



Import result Scene details Scene data		-Input size-			-Size after	impo	Warning! 1 unit is in i drawn in <i>n</i> leave the PVsyst wi <i>meters</i> .	The DAE inches. neters in units a Il conve	file default If you have n SketchUp, is they are. ert them to
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Faces	282	Size on Y		644.030	Size on Y	r	16.358		
		Size on Z		350.244	Size on Z	z	8.896		
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Automatic X	0.000 in	Y 0.000	in Z	0.000 in		/ 180° r	rotation		
PV objects									
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Niraj_Shoe_Sole		PVmoo	dule 🖌	Niraj_Shirt	🗌 Nira	j_Skin		~	
Niraj_Hair_Dark		🗌 Niraj	Pant_Sha	adow					
Convert matching face	es to				Tick	the	PV modu	ule	
Fixed Tilted Plane									
Field parameters-									
Module orientation	Lands	scape	\sim						
Modules X spacing	0.	02 m		Modules Y spa	cing	0.0)2 m		
					,				
Terrain (grou	nd topography	y only)							
Select materials which	describe the gro	ound						×	
Niraj_Shoe_Sole		PVmoo	dule	Niraj_Shirt	🗌 Nira	j_Skin		~	
Niraj_Hair_Dark		Niraj_	Pant_Sha	wobe	Nira	j_Pant		~	
				🗙 Can	cel		🗸 ок		

Figure 16 : The results of the import into PVsyst

By ticking the *ModulePV* box, you define the *ModulePV* material as a PV object.



1.5.2 Setting up the 3D scene in PVsyst

Once the 3D scene has been imported into PVsyst, there are several steps to complete before finalization.



Figure 17 : The 3D scene oriented North in PVsyst

1. The orientation of the 3D scene is not defined in the same way as in SketchUp. After the import into PVsyst, it is reversed by 180°. To alter it, you need to shift the reference.

Click on the button at the top right:



2. Change the reference shift in the azimuth difference box; by indicating 160°: the resulting azimuth will be 20°. Click on « Confirm button » .

Scene objects Tools	Reference
Geographical > Buildir	ng
Azimuth difference	0.0 °





4. The scene orientation is now correct. The scene and modules are oriented at 20° as defined in the "*Orientation*" tab.



Figure 18 : The 3D scene oriented 20° South in PVsyst

5. In the "*Tools*" tab, check "*Deactivate verification of field interpenetration*" and confirm.



Figure 19 : Deactivate the verification of field interpenetration in PVsyst

This parameter is useful for checking the interpenetration of the PV field with other objects drawn in the 3D scene. This parameter must be ticked, otherwise PVsyst will display an error message. The active surface is located 1 cm above the drawing of the frames and PVsyst requires a minimum safety margin of 2-3 cm. If the 3D drawing has been done correctly, you can tick this box, and no problems will arise in calculating the scene.

The import of the 3D scene into PVsyst is now complete. The project simulation can begin.



2 Plug-in Archelios Pro

The Archelios Pro plug-in offers a wide choice of PV modules. You are advised to access the tutorials produced by Archelios Pro on their website.

Take the previous example with the house scene. Choose a PV module model and implement the configuration as shown in the following image.

Below is the 3D scene drawn in SketchUp with the PV modules from the Archelios Pro



Once you've finished drawing in SketchUp, simply export your design in *3DS* or *DAE* format.

It is important to respect the dimension of the active surface between the defined system and the 3D scene. PVsyst accepts a tolerance of 8%.

2.1 The project on PVsyst

You need to carry out the same procedure as in Chapter 2.

When importing, it is important to select the box that will activate the material(s) as an active surface. It is not necessary to assign a material as the Archelios plug-in has already



done this. Depending on the imported format, the name of the assigned material is different.

2.2 The 3DS format

For the 3DS format, it is important to check the units and click on PV_singl

Import result	- 0	x
Scene details	•	
Scene data	-Size after import-	
Objects 70 Units Meters (m) 🗸	Units Meters (m)	
Vertices 2468 Size on X 30.990	Size on X 30.990	
Faces 435 Size on Y 25.320	Size on Y 25.320	
Size on Z 8.286	Size on Z 8.286	
- Translation-	Rotation around origin	
Automatic X 0.000 m Y 0.000 m Z 0.000 m	Apply 180° rotation	warning! The 3DS file
		in your Skotchl In drawing If
PV objects		you have drawn in meters,
Define orientation according to: Best azimuth O Longest e	dge O East/West	in SketchUp, PVsyst will
Select materials which describe PV faces		display the units in meters.
Niraj_Pa Niraj_03 Niraj_04 Archelio	FrontCol ^	
🗌 Niraj_Ha 🗌 Niraj_01 🗌 Niraj_Sh 🛛 🗹 PV_singl	🗌 Niraj_Sk 🗸 🗸	
Convert matching faces to		
Fixed Tilted Plane	\sim	
Field parameters		
Module orientation Landscape \checkmark		
Modules X spacing 0.02 m Modules Y space	^{ting} 0.02 Tick the	e PV_singl box
Terrain (ground topography only)		
Select materials which describe the ground		
Niraj_Pa Niraj_03 Niraj_04 Archelio	FrontCol ^	
Niraj_Ha Niraj_01 Niraj_Sh Niraj_Sk	🗌 Foregrou 🗸	
Canc	еl 🗸 ОК	
		_

Figure 21 : Importing a 3DS file into PVsyst

Once you have imported the SketchUp 3D scene in the format of your choice, follow the same process as in *chapter 2.2*.



2.3 The DAE format

For the DAE format, it is important to check the units and click on PV-singlecrystaline.

Once you have imported the SketchUp 3D scene in the format of your choice, follow the same process as in *chapter 2.2*.

-Scene data Objects 101	-Input size Units Inches (in) V	–Size after import– Units Meters (m)	Warning ! The DAE file defaults to units in inches. If
Vertices 2144 Faces 277	Size on X 1220.067 Size on Y 996.851 Size on Z 326.228	Size on X 30.990 Size on Y 25.320 Re on Z 8.286	you have drawn in meters, in SketchUp, leave the units as they are. PVsyst will
-Translation Automatic X 23.000 in	Y 33.000 in Z 0.000 in	Rotation around rigin	convert them into meters.
 PV objects Select materials which describe PV faces Niraj_Shoe_Sole Niraj_Shoe_Stitching Archelios-ModulePV 	9 PV-singlecrystalline Niraj_Hair_Gray Niraj_Shirt Niraj_Ski	Niraj_Pant ^ material	
Convert matching faces to Fixed Tilted Plane -Field parameters		~	
Module orientation Landso Modules X spacing 0.0	zape V 2 m Modules Y spacin	ng 0.02 m	Tick the PV-singlecrystaline box
Terrain (ground topography	only)		
elect materials which describe the grou Niraj_Shoe_Sole	Ing Niraj_Pant Niraj_Shoe_S material Archelios-Mod	titching dulePV	

Figure 22 : Importing a DAE file into PVsyst



3 PVcase Ground Mount

You can export a project created in PVcase to PVsyst. There are two PVcase plug-ins for AutoCAD:

- PVcase Ground Mount
- PVcase Roof Mount

In the first part of this tutorial, we will show an example using PVcase Ground Mount and in the second part, an example using PVcase Roof Mount.

For this tutorial, we will create 2 example projects in PVcase Ground Mount:

- 1. Project without a plot of land or topography
- 2. Project with land and existing topography imported from the internet.

3.1 Example of a project without land and topography

3.1.1 Defining the project in PVcase

For this tutorial, you will first need to create a project in PVcase with no imported plot of land or topography.

Below is an example of a plot of land measuring 400 meters long and 300 meters wide.



Figure 23 : Scene without imported plot of land in PVcase

3.1.2 Exporting the project to PVsyst

In the main menu, go to the *Tools* bar.



Figure 24 : PVcase menu bar



Click on "Export to PVsyst".



Figure 25 : Tools menu

A new window appears from which you can choose the format to export to PVsyst.

The choice of format depends on your version of PVsyst:

- ▶ If your version of PVsyst is 6.8 or lower, you must export in .DAE. format.
- > If your version of PVsyst is 7.0 or higher, you should export in *.PVC*. format.



Figure 26 : Window for choosing the export format

NB: For this tutorial, .*PVC* format will be chosen.

Click on "*Export*" and choose the location.



3.1.3 Importing the *PVC* file into PVsyst

Click on "Near shadings".

TOJECE	📩 New 📂 Lo	ad 💾 Save 🏹 Import 🍺 Export	🗘 Project settings 🛗 Delete	Lient	1	
roject's name	exemple tutoriel PVcase		Client name Not define	d		
ite File	Genève_MN82.SIT	Meteonorm 8.2 (2001-2020)	Switzerland			
leather data File	Geneva_MN82_SYN.MET	Meteonorm 8.2 (2001-20	20) Synthetic 5 k 🗸	a 🛢 💡		
		Please define the system !				
ariant	🛨 <u>N</u> ew 💾 Sa	ive 🖌 Import 🛅 <u>D</u> elete 🔯 Mar	nage		1	
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ariant n° V lain parameters Orientation	C0 : tutoriel PVcase 1 Optional Horizon	-Simulation	Results overview System kind System Product Specific product Performance Ra	No 3D sce on 0.01 on 0.01 to 0.01	ene defined, no shadings 0 kWh/yr 0 kWh/kWp/yr 0	
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ariant n° V ain parameters Orientation System Detailed losses Self-consumption	C0 : tutoriel PVcase 1 Optional I Horizon I Near Shadings I Module layout I Energy management	Simulation Run Simulation Advanced Simulation Report	Results overview System kind System Product Spedic product Performance Ra Normalized prod Array losses System losses	No 3D sco on 0.00 to 0.00 to 0.00 uction 0.00 0.00 0.00	ene defined, no shadings kWh/yr kWh/kWp/yr kWh/kWp/day kWh/kWp/day kWh/kWp/day	

Figure 27 : Projet in PVsyst

The "Near shadings definition " window opens. Click on "Construction/Perspective".

🌈 Near Shadings defin	ition, Variant "tutoriel PVcase 1"	– 🗆 X					
Near shadings 3D s	cene						
Comment	New shading scene						
	Construction / Perspective	Import Export					
Compatibility betw	een system parameters and shading definitions						
Orientation	Orientation Fixed, Tilt 30.0°, Azim. 0.0°						
Number of sub-arrays PV modules / tables ar Number of PV modules	PV system 3D scene 1 No 3D scene defined 20 0	-Shading factors					
	No shadings defined for this simulation.	Table					
		👝 Graph					
Use in simulation	Calculation mode						
No Shadings							
O Linear shadings							
O According to modul	e strings						
O Detailed electrical o	alculation (acc. to module layout)						
Q System overv	view Print K Cancel	🗸 ок					

Figure 28 : Defining near shading



The 3D scene window opens. This is where you import the .PVC file.

Click on "File".

🕝 s	ihading sc	ene const	ruction					,					,							
File	Create	Select	Edit	View	Tools	Help														
t,	<u>N</u> ew sce	ene		Ctr	I+N		t.	x, ^Y	x ^Z	^z y	t. 🛃		Đ	Θ		\sim				m (
	<u>R</u> ead sc	ene		Ctr	I+O			Point	of view	7 7				Zoo	m	10,	Re	nder	Mod	ules
	R <u>e</u> ad bu	iilding			- 1														1	
	Re <u>a</u> d ob	jects																	Ze	nith
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Figure 29: Import PVC file to the 3D scene

Click "Import" and "Import a 3D scene".

A file explorer opens. Select the PVC file.

🕝 s	hading scene construction						
File	Create Select Edit Vi	ew Tools	s H	elp			
•	<u>N</u> ew scene	Ctrl+N	<u>Ш</u> ,	(x^{Y}) (x^{Y}) (x^{Z}) (x^{Z})			
	<u>R</u> ead scene	Ctrl+0					
	R <u>e</u> ad building			1 on to view			
	Re <u>a</u> d objects						
•1	<u>I</u> mport	+	ø	Import a 3D scene (3DS, DAE, PVC)			
	E <u>x</u> port scene (.SHD)	Ctrl+S	H2P	Import a Helios3D file (H2P)			
	Export selected objects (.SH	HO)	Import ground data (CSV)				
	Save scene view	•		Imp <u>o</u> rt a ground image			
•	Prin <u>t</u>	Ctrl+P	Γ				
×	<u>C</u> ancel	Ctrl+Q	h.,		<		
1	Close scene	Ctrl+W	``	·····			
_			1	and the second s	\leq		

Figure 30 : Selection of PVC file to import to the 3D scene



A window allows you to check the details of the scene. The input file unit is selected automatically but you can change it if it is not the correct one:

Scene details		_Input size			_Size after in	nport
Objects	352	Units	Meters (m)	\sim	Units	Meters (m)
Vertices	1408	Size on X	36	5.684	Size on X	365.684
Faces	352	Size on Y	29	6.275	Size on Y	296.275
		Size on Z		1.255	Size on Z	1.255
Franslation	X -166.000 m	Y 146.000	m Z 0.00	0 m	Rotation are	ound origin 80° rotation
PV objects						
fine orientation acco	ording to:	🖲 Best a	azimuth	ОĿ	ongest edge	

Figure 31 : Import results

Click on the "*OK*" button.



Figure 32 : Imported 3D scene in PVsyst

The scene precisely matches the predefined scene in PVcase. Click on "Close scene".



3.2 Example of a project with a plot of land and topography

3.2.1 Defining the project in PVcase

The project will be created in PVcase with:

- The site with the satellite photo of the imported site
- The topography imported from the internet or created by yourself
- The generated mesh for the plot
- A few trees positioned on the lower side



Figure 33 : PVcase project window on a topography imported from the Internet

The targeted zone represents a rectangle measuring 400 meters by 300 meters.



3.2.2 Exporting the project to PVsyst

Exporting occurs in the same way as before (see 3.1.2), except for two details, as defined below.

When you click on "*Export to PVsyst*", you have a choice between two export modes:

- the PV field only, "FRAMES"
- the PV field with topography, "TERRAIN AND FRAMES".

By selecting "TERRAIN AND FRAMES", you export the topography with the PV field.



Figure 34 : Choix export sur PVcase Ground Mount

For this tutorial, only the "FRAMES" PV field will be imported.

Click on "FRAMES", then select the file output format *PVC* and finally select the file location.



Import result					- 0
Scene detai	ls				?
Scene data		-Input size-		Size after in	nport
Objects	548	Units	Meters (m) 🗸 🗸	Units	Meters (m)
Vertices	6592	Size on X	404.211	Size on X	404.211
Faces	1780	Size on Y	320.995	Size on Y	320.995
		Size on Z	27.012	Size on Z	27.012
Translation	X 0.000 m	Y 0.000	m Z 0.000 m	Rotation are	ound origin
Define orientation a	ccording to:	Best azim	uth O Longest	edge (CEast/West
🔀 Terrain (gro	ound topograph	ny only)			
Select materials whi	ch describe the gr	round			
Tree_trunk	Tree_crown				
			• Com	-al	OK

3.2.3 Importing the PVC file into Pvsyst

Figure 35 : Import results

The procedure for importing a PVcase project into PVsyst is the same as above (see 3.1.3)

Once the project has been successfully imported, you can see that the scene precisely matches the same scene defined in PVcase.



Figure 36 : Imported 3D scene in PVsyst

In this configuration, depending on the topography, the PV tables might have several orientations, but in this example, PVsyst has grouped all the tables and averaged them to create a single orientation. In addition, the trees defined in PVcase have also been imported.



4 PVcase Roof Mount

4.1 Defining a project

First you must define a project with the PVcase Roof Mount plug-in.



Figure 37 : Example of a 3D scene project in PVcase Roof Mount

A building with a large roof was selected. Using PVcase, PV modules were automatically placed with an azimuth of 45° and a tilt of 20°. Also, 4 trees were placed in the top right-hand corner. The azimuth configuration in PVcase is the same as in PVsyst.

4.2 Export procedure

In the main menu, go to the "Actions" toolbar.

Then click on "Export to PVsyst".



Figure 38 : PVcase Roof Mount menu toolbar



AutoCAD will ask you to select the elements to be exported. Select the entire 3D scene.

The window will open and ask you to choose the format. Click on *.PVC* format, then on "Export"..

OPVsyst export format	×
PVsyst 6.8 or lower	PVsyst 7.0 or higher
.DAE	.PVC
Don't ask again for this session	Export

Figure 39 : PVsyst export format

Select the file location, and the export is complete.

4.3 Import to PVsyst

In PVsyst, click directly on "Near shadings" without defining "Orientation" nor "System".

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Figure 40 : PVsyst window



Click on "Construction/Perspective".

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O Linear shadings										
O According to modul	e strings									
O Detailed electrical c	alculation (acc. to module layout)									
Q System overv	iew Print Cancel	🗸 ок								

Figure 41 : "Near shading" window

Then click on "File", "Import", and finally "Import a 3D scene (*3DS, CAD, PVC)"

(e	Shading scene construction		
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	Read objects		Zenith
•	<u>I</u> mport	>	import a 3D scene (3DS, DAE, PVC)
	Export scene (.SHD)	Ctrl+S	Import a Helios3D file (H2P)
	Export selected objects (.S	HO)	Import ground data (CSV, TIF)
	Save scene view	>	Import a ground image
e	Prin <u>t</u>	Ctrl+P	Download a satellite ground image and/or ground data
×	<u>C</u> ancel	Ctrl+Q	
1	C <u>l</u> ose scene	Ctrl+W	

Figure 42 : 3D scene before import



Click on "OK".

Import result					- 🗆 :
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PV object	ts n according to:	Best azimuth	O Longest e	:dge O E	ast/West
🔀 Terrain (ground topograp	hy only)			
Select materials v	which describe the g	ground			
Roof	Tree	Block			
			X Canc	el	🗸 ок

Figure 43 : Import Results



Figure 44 : 3D scene after import

The scene has been imported into PVsyst. You can see that all the elements defined in PVcase have been imported.



5 PVcase to PVsyst version 6.8 or earlier

It is possible to import a PVcase project into PVsyst version 6.8 or earlier. The procedure is explained below.

5.1 Defining a project

Let's go back to the previous project example, a PV system on a topography with objects that needs to be created.



Figure 45 : PVcase project window on a topography imported from the Internet for PVsvst v. 6.8



5.2 Export procedure

To export, click on "*Export to PVsyst*", and select "*FRAMES*" to export PV tables and objects only.



Figure 46 : Choice of export on PVcase Ground Mount for PVsyst v. 6.8 8

Choose the *DAE* format to export to PVsyst version 6.8 or earlier and click on "*Export*", then save the file in a dedicated folder.



Figure 47 : Choice of DAE format for PVsyst v. 6.8



6 Virto CAD

With the Virto.CAD plug-in in AutoCAD, you can define a scene on a terrain or on a building and export it in PVC format, to then import it into PVsyst.

As a reminder, it is not necessary to export the topography to PVsyst, as this will have no influence on the shading calculation.

In this description, a simple scene with no topography and no shading objects will be used.

6.1 Defining a project

You must first define a project using the Virto.CAD plug-in. The project is a PV field without imported topography. The field measures 300 meters by 200 meters.

Home Ins					press Tools Featured App	s VIRTO.CAD							
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Figure 48 : Field scene PV Virto. CAD

6.2 Export procedure

To export a file to PVsyst, carry out the following steps:

In the Virto.CAD ribbon, go to "*AutoCAD*", then to the "*Extra*" section and finally to "*PVsyst PVC Export*".

Manage In	ant Annotate D	manuatric View Manuna Outrust	Add.inc Collaborate Er	many Tools - Featured Anne	VIRTO CAD		1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -			1989-5862 (U)
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Figure 48 : Virto. CAD ribbon



A new window opens, in which you need to specify the exported file destination.

	Common	
	Common	
Output file:		
✓ Export 3D	ground mesh as additional .CSV file	
✓ Export 3D	shading objects	
Export roo	ftop modules individually	
	Boundaries	
	Select on drawing	
	Colored All	
	Select All	
	Boundaries not selected	
	Process	_

Figure 50 : Dialog to export to PVsyst

Choose a dedicated folder to export the PVC file.

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Click on

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	Common
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 Export 3D ground Export 3D shading Export rooftop mo 	mesh as additional .CSV file objects dules individually
	Boundaries
	Select on drawing Select All Boundaries not selected
	Process
3	Start
	Figure 51 : Choice of export option to PVsvst

"Common": specify the options you wish to export.

- 3D ground meshes: for PV systems with topography
- 3D shading objects: for PV systems with ground and/or roof objects
- Rooftop modules individually: for rooftop systems only

"Boundaries": you can select part or the whole 3D scene.

Warning! You can only select boundaries within the same orientation. If you have different orientations, different exports must be made for each orientation.

"Process": click on "Start" to create the export file.



2

3

6.3 Importing a Virto.CAD PVC file into Pvsyst

In PVsyst, click directly on "Near shadings" without defining "Orientation" nor "System".

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Figure 53 : PVsyst Virto.CAD project window

In this new window, click on "Construction/Perspective".

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No Shadings							
O Linear shadings							
O According to module st	rings						
O Detailed electrical calcu	lation (acc. to mod	ule layout)					
Q System overview	,	Print	×	Cancel		ОК	

Figure 52 : PVsyst dialog to define shading



The new 3D scene window opens. Click on "*File*", then on "*Import*". Select "*Import a 3D scene (3DS, DAE, PVC)*".

Select the *PVC* file previously exported with Virto.CAD.

C Shading scene construction	
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Export scene (.SHD) Ctrl+S	Import a Helios3D file (H2P)
Export selected objects (.SHO)	import ground data (CSV, TIF)
Save scene view	Impgrt a ground image
Print Ctrl+P	<u>Download a satellite ground image and/or ground data</u>
Cancel Ctrl+O	
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Figure 54 : Shading scene PVsyst-import PVC

The "Import Results window provides information about the PVC file. If the objects are already close to the origin, translation to it is not suggested. If the objects are at a distance greater than 5 km, translation is automatically calculated. If you want PVsyst to center the scene at the origin of the 3D view, click on 'Automatic': the translation values will then be recalculated. Click on "*OK*".

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Faces	374	Size on Y	192.946	Size on Y	192.946	
		Size on Z	2.725	Size on Z	2.725	
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Define o	prientation according to:	Best	azimuth O Li	ongest edge		
Check the Automatic box if you want to translate the scene toward the origin			X Cancel		🗸 ок	
		Figure 55	: Import results			





Figure 56 : PVC imported into the shading scene

The 3D scene is imported and centered.



7 Helios 3D

7.1 Defining a project

A project must be defined beforehand using the HELIOS3D plug-in in Civil3D. The project is a PV field on a topographic surface configured with the Civil 3D tools.



Figure 57: 3D scene in Civil3D

7.2 Export procedure

To export a file to PVsyst, follow the below procedure:

Under the HELIOS3D tab, click on "*Output*", then on the PVsyst button to export a file in .*h2p* format

HELIOS3D					
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Reports Excel	Posts PVsyst	Browser +			
Documents	Export				

Figure 58: HELIOS3D tab



In the export window, save your file in *.h2p* format to the desired location by clicking on the "*Save*" button.

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Type : PVsyst-Export (*.h2p)						~
 Masquer les dossiers 					Enregistrer Ann	uler

Figure 59: Export .h2p file

Your project is exported in.*h2p*. format.

7.3 Importing an .h2p file into PVsyst

In PVsyst, click directly on "Near shadings" without defining "Orientation" nor "System".

Project	🛨 New 🚬	🏷 Load 💾 Save 🍑 Import 🍺 Export	Project settings	Delete	<u>C</u> lient		/	1
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In this new window, click on "Construction/Perspective".

Figure 61: Near shading dialogue box

The new 3D scene window opens. Click on "*File*", then on "*Import*" and finally on "*Import* a Helios3D (H2P) file".

Shading scene construction					
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Figure 62: Import 3D scene file in PVsyst





Select the *h2p* file previously exported with Helios3D.

Figure 63: 3D scene in PVsyst with imported file

The *h2p* file is correctly imported into the PVsyst 3D scene.



8 Importing PVC file with multiple orientations and topography

We demonstrate how in PVsyst version 8, the importation of a PVC file with two orientations and topography reacts.

In Pvsyst window, click on "Near shadings".

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Storage	Economic evaluation	Detailed results						
		L					_	
System overview							🔁 Ex	t

Figure 64: PVsyst window for multiple orientation import

The "Near shadings definition" window opens. Click on "Construction/Perspective".

루 Near Shadings defin	tion, Variant "New simulation variant"	– 🗆 X
Near shadings 3D s	cene	
Comment	New shading scene	
	Construction / Perspective	Import Export
Compatibility betw	een system parameters and shading definitions	
Orientation	Fixed, Tilt 20.0°, Azim. 0.0°	Q Orientations
Number of sub-arrays PV modules / tables ar Number of PV modules	1 No 3D scene 1 No 3D scene defined a 0.0 m ² 0 No shadings defined for this simulation.	Shading factors
Use in simulation—	Calculation mode	
No Shadings		
O Linear shadings		
O According to modul	e strings	
O Detailed electrical c	alculation (acc. to module layout)	
Q System overv	iew Print K Cancel	🗸 ок

Figure 65: Near shading window





Click "File", then click "Import" and then click on "Import a 3D scene (3DS, DAE, PVC)"

Figure 66: Import 3D scene file in PVsyst

Choose the project with the variant having two orientations and import it.



-	1115					4
cene data		Input size-		Size after	import	
Objects	586	Units	Meters (m) \sim	Units	Meters (m)	
Vertices	4360	Size on X	463.442	Size on X	463.442	
Faces	1258	Size on Y	482.128	Size on Y	482.128	
		Size on Z	29.387	Size on Z	29.387	
ranslation					around origin	
Automatic	x 0.000 m	Y 0.000	m z 0.000 n		180° rotation	
PV objects	according to:	O Rest azim	with Olympic	at a dag	© East Mast]
PV objects	according to:	○ Best azim	nuth O Longe	st edge	East/West	
PV objects Define orientation	according to: round topograp!	O Best azim	nuth O Longe	st edge	East/West	
PV objects Define orientation Terrain (gr Select materials wh	according to: round topograpl	O Best azim hy only) round	nuth O Longe	st edge	East/West	×
PV objects Define orientation Terrain (gi Select materials wh Tree_trunk	according to: round topograp! nich describe the gi	O Best azim hy only) round	nuth O Longe	st edge	East/West	×

Figure 67: Import result window

In this particular example we are importing domes. So to help PVsyst generate the correct orientations you must select the orientation type of the PV objects as 'East/West'. Then click "Ok".



Pvsyst has imported the scene:



Figure 68: 3D scene with the PVC file imported

You can notice that PVsyst has created two new orientations, which automatically include the east and west PV modules it identified.



Figure 69: Orientations management location





If you click on orientation #3 PVsyst selects the tables that belong to this orientation:

Figure 71: Orientation coloured





It shows the tables of your scene with a different colour for each orientation:

Figure 72: 3D scene with coloured orientations

Then, by clicking on "Orientation management":



Figure 73:Orientationn button location

It allows you to open a new window where you can manage different PV orientations of your scene, see below:





Figure 74: Orientation management windows

