



EBOOK

Your step-by-step guide to C&I rooftop solar efficiency

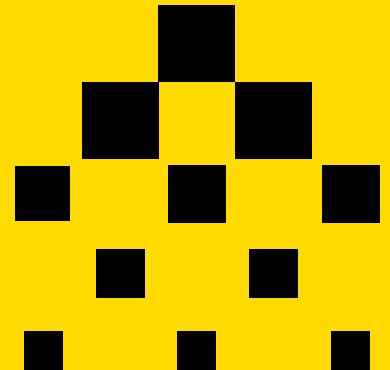


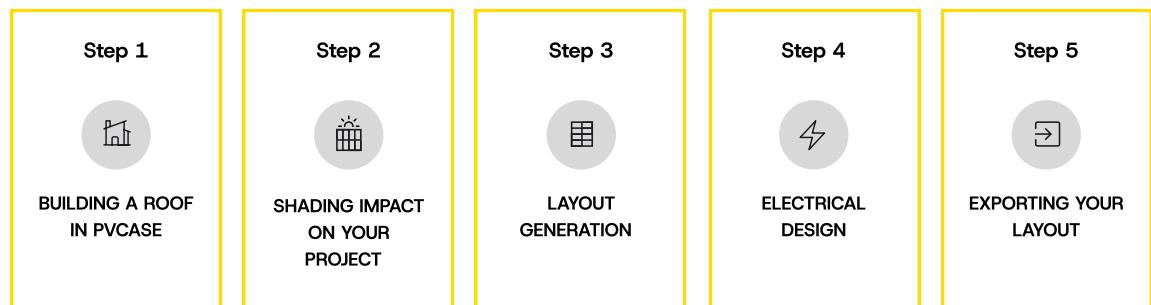
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Introduction

PVcase Roof Mount, an AutoCAD add-in, is designed for industrial and commercial self-consumption photovoltaic projects. This comprehensive solution streamlines the development of rooftop solar projects and ensures every detail is covered for improved accuracy and reliability.

In this eBook, we'll break down how PVcase Roof Mount improves every step of a solar project by transforming these core aspects:



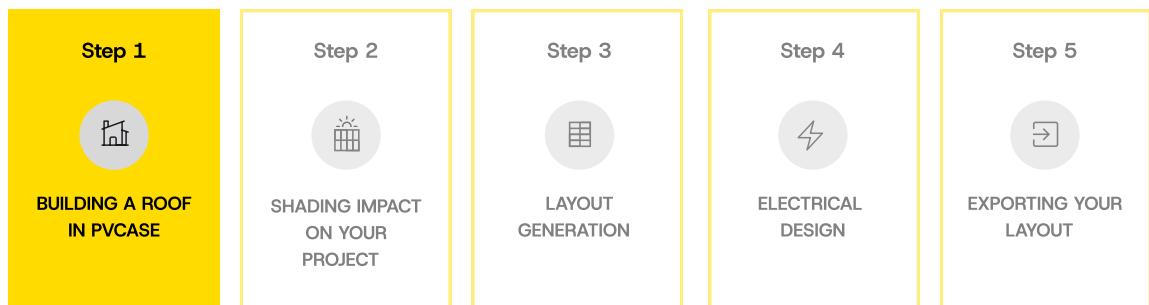
Central to any rooftop solar project is the early adoption of detailed design.

Why?

Early detailed design ensures precision from the outset, optimizing your workflow and enabling informed decisions on shading analysis, layout optimization, and electrical design. It unlocks cost-saving potential, eliminates costly changes down the line, aids realistic visualization, facilitates cabling and inverter integration, and ensures meticulous documentation. Embracing early detailed design offers flexibility, time savings, and leads to an efficient photovoltaic project development process. Join us on this journey towards solar excellence, guided by detailed design.

STEP 1

Build your digital roof



To commence your project, you'll first need to create your virtual roof. This often involves obtaining an orthographic photo of your building or acquiring its dimensions. For this purpose, PVcase offers a "*Select image from Google satellite*" feature. Utilizing this functionality allows you to choose a map location and import a viewport directly into your AutoCAD model space.

Once you have the image, the Roof Builder lets you create the structure. You can draw the building's perimeter line or select an existing one in the drawing. When the building is generated, its defined height will automatically apply to all sides. Once the building's elevations are defined, you can begin adding various roof features. You can:

Assign a height to any side of the roof.

Assign a desired roof slope.

Add a ridge.

Assign a parapet: sloped or horizontal.

Create a safety path.

Create a wide variety of objects on the roof:

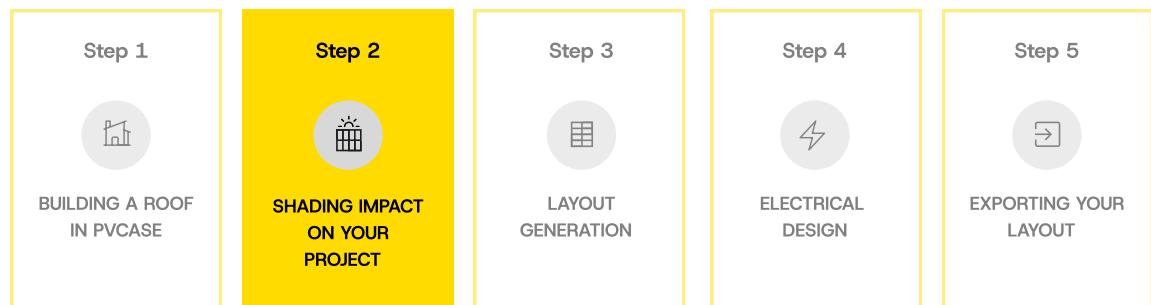
- Blocks
 - Restriction zones
 - Chimneys
 - Skylights
 - Air conditioning systems
 - Smoke ventilators
-

Define objects near the roof:

- Trees
 - Buildings
-

STEP 2

Analyze the impact of the shadows



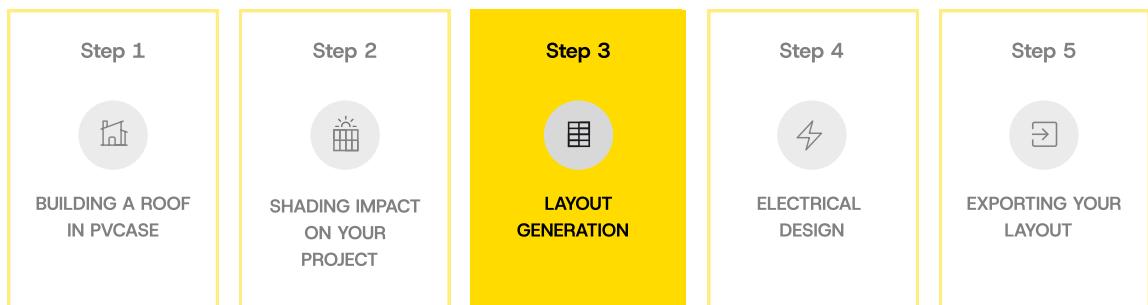
The shading analysis empowers solar engineers to rapidly identify roof areas affected by shadows from roof features, adjacent objects, or buildings. PVcase provides a specific type of shading analysis intended for use before placing PV modules. The outcome is a projected closed polyline representing the shadow generated by objects in the layout.

Furthermore, another valuable feature is the ability to generate flat south modules with a variable pitch. This adjustment is based on the roof's slope, its location, and the selected date and time of year. You can use it to generate a PV area that effectively avoids inter-row shading.

The shading analysis completed, various layouts can be generated and compared for optimal results.

STEP 3

Place the modules



To proceed with layout generation, module and layout settings must be defined. In PVcase, this procedure is divided into two distinct features:

1. Module settings

2. Layout settings

PVcase does not include a pre-defined collection of modules by manufacturer dimensions. Therefore, users will need to specify the length, width, thickness, and power themselves.

To place modules on the roof using PVcase, you must first define the layout settings and divide the roof into different PV areas. This segmentation is based on varying orientations and module placements. A PV area is a closed polyline that defines a specific section of the roof. We recommend drawing PV areas that include offset distances from the roof's edge.

There are four distinct types of module placement:

01

Flat south

Modules are placed with either landscape or portrait orientation, utilizing a specified tilt angle and height.

02

Flat east-west

Modules face east and west with a given tilt angle.

03

Flat east-west

Similar to flat east-west placement, but the joint between modules forms the lowest point of the V-shape.

04

Flush mount

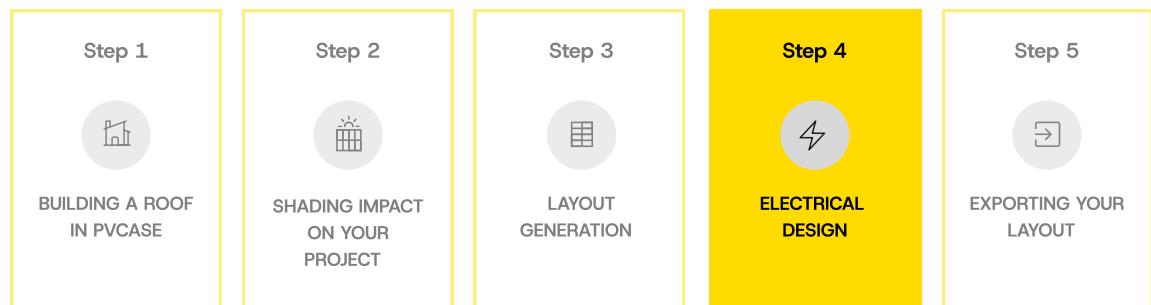
This involves installing solar panels directly onto the roof surface, allowing the roof's slope to dictate the module inclination.

Beyond module orientation and placement, you can define the arrangement according to a desired pattern. The primary purpose of this feature is to design a layout that accounts for maintenance corridors. This allows for a flush mount arrangement with appropriate spacing to facilitate access to the modules.

Once the layout has been generated, you will likely want to ascertain its capacity. This information is accessible through the *Layout Information menu*. If you are not satisfied with the result, you can modify the arrangement and regenerate it. This process allows you to view the history of generated layouts and regenerate them according to your preferences. Thus, it proves highly useful for comparing different layout capacities and switching between them to see how each fits on the roof.

STEP 4

Design your electrical system



After generating the layout, you can seamlessly transition to electrical design. PVcase enables you to place your inverters, create strings, associate them with their respective MPPTs, and generate realistic cabling.

The initial step involves defining the inverter locations. Inverters are represented as prism-shaped objects with fully customizable dimensions. You can position them either on top of the roof or inside the building at a desired height. This feature proves particularly advantageous for cabling generation, enhancing the sense of realism.

To continue the electrical design process, you will generate the stringing. For this purpose, you can string modules either by PV area or by module selection. Additionally, custom stringing is available by selecting individual modules and then copy-pasting the custom string over unstrung modules. This flexibility allows for either a fast, homogeneous design or a fully detailed, customized layout. Note that string labels can be changed and updated according to user preferences throughout the project's development.

Once all modules are strung together, you can begin pairing them with their parent device. In the cabling window, you can generate either a basic or a more complex electrical design.

For a basic design, you can set the number of strings per inverter and pair them. The complex design option allows you to define the number of MPPTs and inputs per MPPT, pair them together, and switch positions if desired.

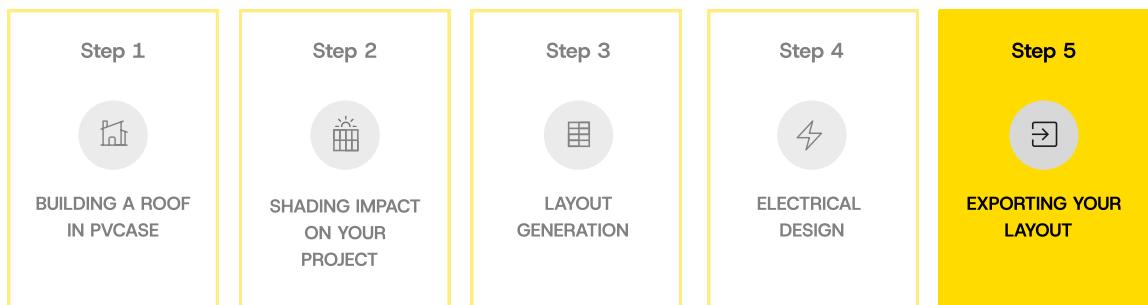
Having finished defining the inverters, they can be highlighted using color coding; all strings belonging to the same inverter will be colored accordingly. This feature facilitates quick and easy understanding of your layout.

When the stringing design is finalized, you can proceed to cabling.

Here, you will first draw the tray, and subsequently, generate the cabling. Tray dimensions can be user-defined or automatically adjusted based on the number of cables in each trench segment. Once the cable trays are placed, cabling can be generated. It will automatically be routed through the closest cable tray and find the shortest path to the parent device.

STEP 5

Export the layout



Export layout data as an XLSX File

To extract all information from your layout, you can export the Bill of Materials as an Excel file. The BoM will contain two distinct sheets:

1. Project overview

2. Electrical Information

The Project Overview provides a summary of the most relevant parameters, including total capacity by PV area, module quantity, module placement type by PV area, number of strings, cable length, and cable tray.

Similarly, the Electrical Information sheet provides comprehensive details for the electrical design associated with each inverter. You will find all different DC cable segments, such as module cables, extension cables, total cable length for each string, and cables for positive and negative connections to inverters.

Export the layout as a PVC file (PVsyst)

Another highly requested feature is the PVC export. Once your layout has been generated, you can click the "Export to PVsyst" button to convert your DWG file to PVC. This allows you to then import it into your PVsyst project to account for near shading losses.

About PVcase

PVcase is moving solar forward with an alternative to the traditional labor-intensive, time-consuming, and error-prone solar project development process. Our end-to-end solar development platform connects site selection, PV design, and yield estimation. In doing so, we're not only helping solar teams achieve maximum results in a fraction of the time, we're accelerating the global transition to clean energy. PVcase ends clunky processes and corrupted data to clear the path to a net-zero economy.

Whether you use a single product or plug into the entire platform, PVcase makes you faster, more precise, and more productive at every stage of solar project development. PVcase is a leading choice for solar energy professionals, and the results speak for themselves. Our platform supports over 1,500 customers in 75+ countries, powering the development of more than 4 TW of projects a year.

See for yourself

■ [BOOK A DEMO](#)

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