User manual

ValkPVplanner**Pro**

www.valkpvplannerpro.com

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About the ValkPVplannerPro application

ValkPVplannerPro is Van der Valk Solar Systems' advanced online tool for planning and calculating solar panel installations on flat roofs. The application is suitable for both experienced installers and beginners, offering an easy-to-use interface with powerful features to make the design process easier.

Currently, the software is tailored for flat roof installations, but in the future, it will also support pitched roof designs.

Key Benefits:
- **Versatility:** Perfect for both large commercial projects and residential solar installations.
- **Reliability:** Ensures all structural and ballast calculations are in line with Eurocode standards (EN 1990, EN 1991-1-3, EN 1991-1-4).
- **Efficiency:** Automatically optimizes ballast distribution and system cost planning.
- **Ease of Use:** Intuitive software with smart design tools, making the process easy for both beginners and professionals.

Key Features:
- **Flexible Design Options:** Create layouts based on satellite images, white backgrounds, or custom images.
- **Smart System Configuration:** Automatically sizes and labels panel fields for faster and more accurate designs.
- **Optimized Ballast Distribution:** Prevents exceeding allowable roof and point loads for safer installations.
- **Comprehensive Database:** Access an up-to-date list of panel types, with simple filtering options to find the best match for your project.
- **Complete Project Planning:** Generate detailed project plans and a bill of materials, including cable management and additional components.
- **Reliability:** Intelligent controls and precise calculation modules ensure safety and compliance with all technical and building standards.
- **Virto CAD Integration:** Seamlessly integrates with Virto CAD for detailed project design and support.
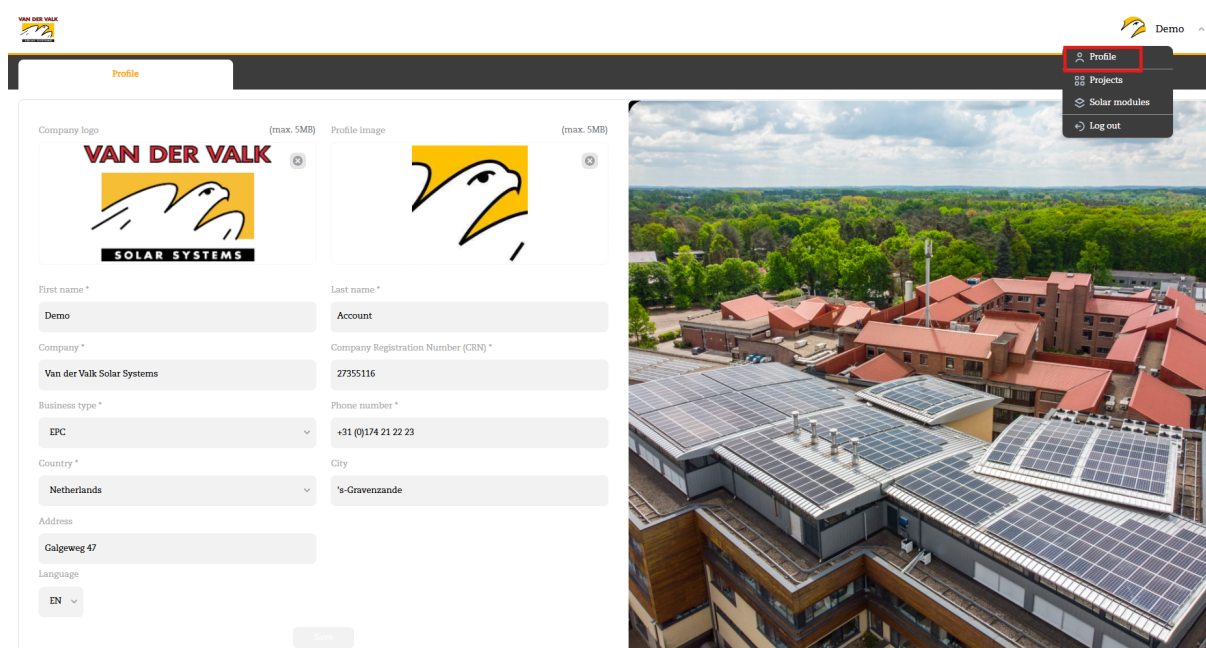
1. Profile Settings

The Profile page allows you to manage account settings and visual elements of your company profile. You can access this page from the top-right menu by clicking on Profile.

Here, you can:
- **Company logo:** Upload or change the company logo, which will appear in project reports and overviews.
- **Language:** Select your preferred language. This setting also determines the language used in your project reports.
- **Address:** Set your address.
  Note: this setting is for profile information only and does not affect
  project-specific calculations such as wind or snow loads. These values are defined manually
  within each project.

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2. Adding a new solar module

Before creating a custom module, always check if your panel is already available in the built-in database. The database is continuously updated and includes the most commonly used models. *Note: It is recommended to add custom panels only when absolutely necessary, in order to avoid unnecessary duplication and keep your module list well-organized.*

To add a custom solar module, you can either upload a .Pan file, where the details will be entered automatically, or choose the Create New Module option. This will open the Create Solar Module window, where you can manually enter the details of your module.

Once all required details are entered, click Done to save the module. It will now appear in your list and can be used in your projects.

3. Creating a new project

To create a new project, navigate to the Projects from the menu and click on the Create new project button.

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Project info

After clicking Create new project, the Project specification screen appears. Here you can:

- **Project name:** Enter a clear name for your project.
- **Project reference:** Add an internal code or reference.
- **Client:** Type the client's name.
- **Address and Country:** Enter the address to set the project location
- **Logo (optional):** upload a project-specific logo (max. 5 MB).

Design mode

Choose how you'd like to define your roof layout:

- **Google Maps**
  Uses live satellite imagery to trace your roof.
  Requires a valid address for map pin placement.
- **Import PNG/JPG/PDF**
  Upload your own roof plan or architectural drawing. Custom images can also be uploaded and scaled to ensure the drawing matches the actual roof dimensions.
  Useful when you have a custom layout or diagram available.
- **Whiteboard**
  Start from a blank grid and draw your roof outline manually.
  Best for new buildings or sites without reliable imagery.

# Importing an Existing Project

If you already have a project file (JSON), click the Import Project button in the top-right corner of the Project info screen and upload your file. All previous settings and data will load automatically, so you can continue exactly where you left off.

Once you've entered your project details and selected a design mode, click Next to continue.

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Building Step – Drawing the Roof Outline

Once you reach the Building step, you'll see the roof editor screen. Here's how to draw your roof and manage the view:
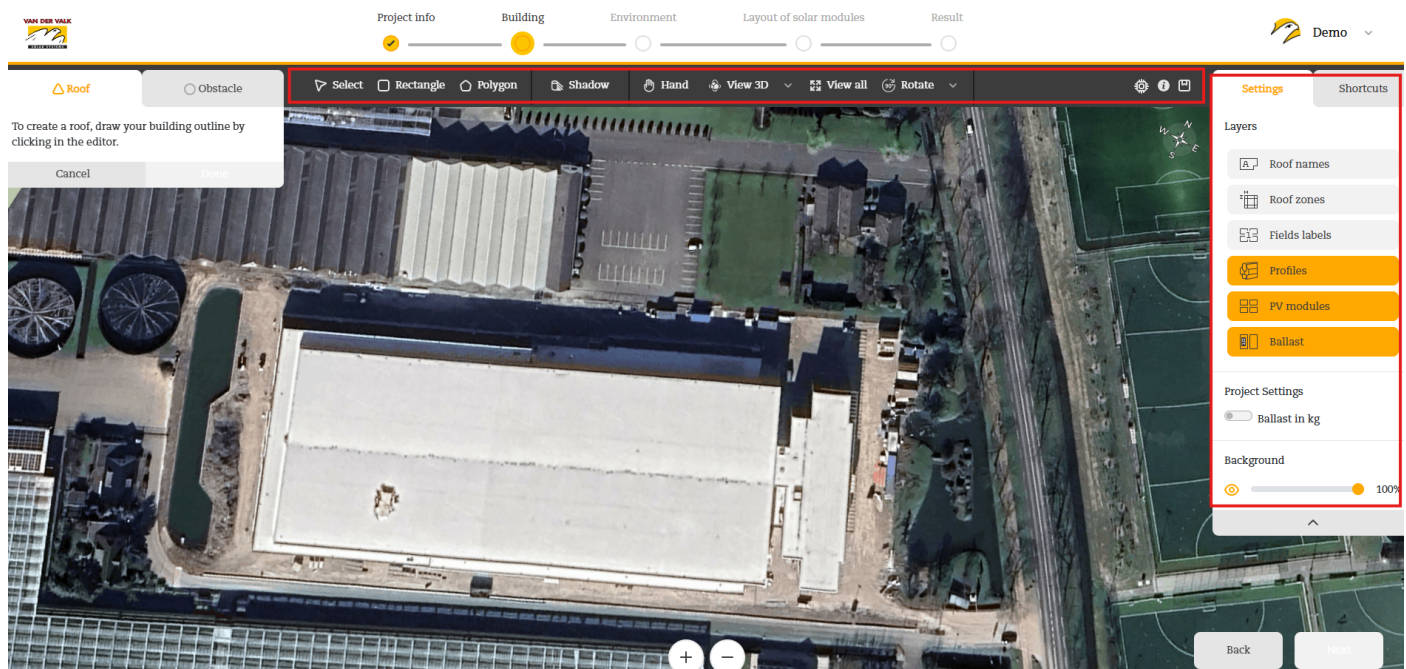
Drawing Tools

- **Rectangle** ▢
  Click once on the map to set the first corner, click again at the opposite corner, then drag to adjust the size.
- **Polygon** ⬡
  Click each corner point in sequence. Double-click or Press Esc to finish the shape once all points are placed.
- **Hand** ✋
  Click and drag anywhere on the map to move your view without altering your drawing.
- **View 3D** 🔷
  Switch between 2D and 3D views to inspect your outline.
- **Rotate** ↻
  Rotate the view in 90° increments to check roof orientation and overhangs.

Tip: After drawing, switch to 3D view and rotate to verify your outline matches the real roof.

3D Navigation
When working in 3D mode, you can move around the model to check your design from different angles.

- **Right-click + drag:** Rotate the view freely.
- **Mouse wheel (scroll):** Zoom in and out.
- **Mouse wheel (press + hold):** Pan or move the camera across the view.
- **Hand tool:** Use the hand icon to move the view by left-clicking and dragging.
- **Rotate button (90° increments):** Quickly rotate the 3D view to standard angles for checking roof orientation and overhangs.

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Shadow simulation

The shadow simulation tool allows you to check how surrounding objects, buildings, or obstacles affect sunlight on your roof throughout the day. This helps you identify potential shading issues and optimize your panel layout.

🗒 Shadow Simulation

Shadow Simulation

Yes	No

Simulation date

28-08-2025	📅

UTC offset

UTC+02:00	˅

06:45   20:45

| 14:00 | 19:00 |

Remove shaded panels

Yes	No

Close	Apply

Options available:
- **Enable/Disable:** Turn shadow simulation on or off.
- **Simulation date:** Select a specific day of the year to test shading conditions.
- **UTC offset:** Adjust the time zone to match your project location.
- **Time range slider:** Move the markers to simulate shading at different times of the day.
- **Remove shaded panels:** Automatically exclude shaded modules from the layout if enabled.

Once your settings are chosen, click Apply to view the simulation directly in the 3D environment.

Saving your project
Save 💾
Click at any time to save your progress. Your current outline, settings, and any edits will be stored so you can return later without losing work.

Settings Panel
Use the settings panel to control how elements are displayed on the map:
- **Roof names, Roof zones, Field labels, Profiles, PV modules**
  Show or hide these layers as needed.
- **Ballast unit**
  Switch between kg and tiles to display ballast weight or tile count.
- **Background opacity**
  Adjust the slider to lighten or darken the map background for better contrast.

Use these controls to fine-tune what you see while drawing and reviewing your roof model.

Shortcuts Panel

Next to the Settings panel, you'll find the Shortcuts panel. This provides a quick reference to all available keyboard shortcuts for performing different actions in the editor. Using these shortcuts allows you to navigate and work more efficiently without relying solely on mouse clicks.
While the full list is displayed in the panel, here are a few particularly useful ones:

- **Press D:** Activate the measure tool to check distances on the roof or between obstacles.
- **Press V:** Switch instantly between 2D planning and 3D visualization.
- **Press Space:** Activate the hand tool to move the view by dragging with the mouse.

	Settings	Shortcuts
General		
View surface		B
Rotate to wall		ALT + Q
Rotate 90 deg		ALT + R
Measure		D
Switch 2D/3D		V
Roof Names Layer		1
Roof zones		2
Field labels		3
Mounting structure		4
Panels		5
Ballast		6
Delete entity		DELETE
Escape entity		ESCAPE
Multiple selection		CMD/CTRL
Pan tool		Space
Building creation		
Circle tool		C
Line Tool		L
Duplicate obstacles		E

Roof Parameters

Once the roof outline has been drawn, the Roof Parameters panel appears. This is where you define the type of roof, roofing material, and its dimensions. These inputs ensure accurate ballast and structural calculations.

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Roof Name:
Each roof you draw is automatically assigned a default name (e.g., Roof A). You can rename a roof by clicking the pencil icon next to the roof name in the parameters panel.

This is useful when working with multiple roofs, as it helps you identify them easily in the layout view and in the final project report.

Roof type:
Select the roof type from the available options.
• **Flat:** Flat-roof buildings with minimal slope.
• **Pitched:** For sloped roofs (available in future versions).

Roofing material:
Select the roofing surface type that is already present on the building. This ensures the correct ballast and design settings are applied.
• **Roof membrane:** For roofs with smooth, sealed surfaces.
• **Gravel:** For roofs that have a loose gravel layer on top.

Membrane type:
Roof membrane available options are:
• Bitumen
• EPDM
• PVC
• TPO/FPO
• Concrete
• Glass fibre

Parapet width/height:
Specify the thickness and height of any parapet wall. If there is no parapet, set both to 0.

Building height:
Enter the total height from ground level to the roof surface, including parapet.

Roof slope:
The vertical rise of the roof is expressed in degrees. It affects water drainage and wind load distribution. For flat roofs, the slope must always be < 5°.

Point load limit (kPa):
Enter the maximum load that can be applied to a single point on the roof, expressed in kilopascals (kPa). This ensures ballast calculations do not exceed structural capacity.

Dead weight:
The total static load from the PV system and ballast. You can choose from:
• **Dead weight (system + ballast):** Only the weight of the installed system and ballast.
• **Dead weight incl. snow, wind:** Includes the system, ballast, and additional loads from snow and wind.

Minimum edge distance:
Enter the minimum allowable distance from the roof edge where PV modules can be placed, ensuring compliance with safety standards. By default, the edge distance is based on the calculated "edge zone" of the roof. In case the user wants to place panels in the edge zone, this is possible by entering a lower edge distance value.

Obstacles

Obstacles can be drawn in the same way as the roof outline, using the Rectangle or Polygon tools. In addition, you can also use the Circle and Line tools to create more precise obstacle shapes that match the real object on the roof.
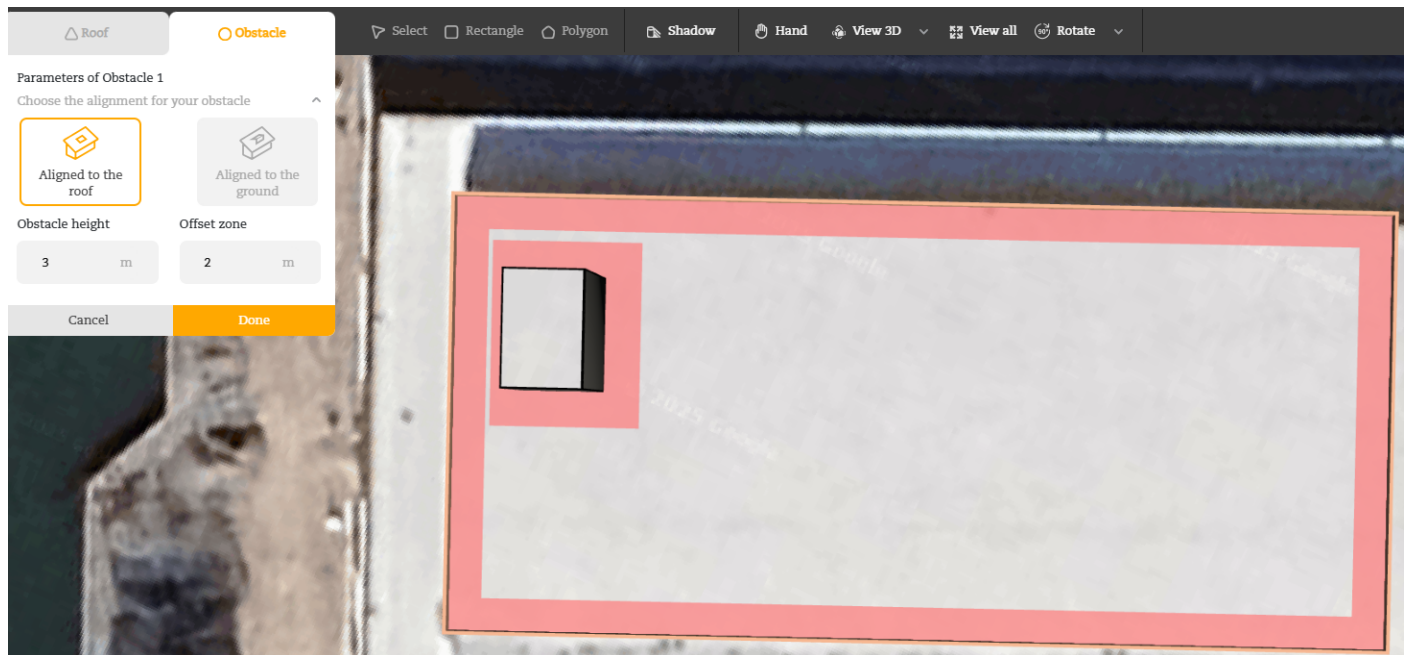
Once an obstacle is drawn, the **Obstacles Parameters** panel appears. Here you can define the alignment, height, and clearance around the obstacle. These settings ensure the planner accounts for the space occupied by obstacles when calculating PV module placement.

Alignment:
Select how the obstacle is positioned in relation to the building:
• **Aligned to the roof:** The obstacle is placed directly on the roof surface. Use this for rooftop objects such as skylights, HVAC units, or small equipment.
• **Aligned to the ground:** The obstacle extends upward from ground level through the building. Use this for elements like chimneys, elevator shafts, or windows that pass through the roof.

Obstacle height:
Enter the total height of the obstacle in meters.

Offset zone:
Set the distance in meters around the obstacle where PV modules cannot be placed. This ensures safe clearance for shading, access, or maintenance.

Once the obstacle details are entered, click **Done** to save.

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Adjusting Obstacles

When an obstacle is selected, a small toolbar appears above it, as shown in the image. The available options are:
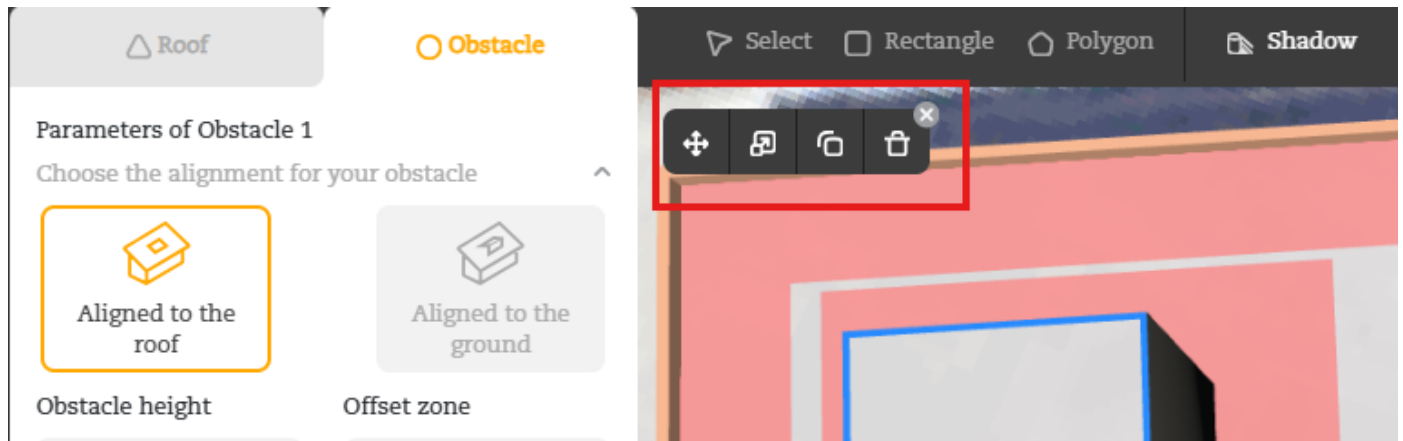
- **Move:** Drag the obstacle to a new position on the roof.
- **Edit shape:** Enter edit mode to adjust the outline (vertices and edges), similar to how you edit rectangles or polygons.
- **Duplicate:** Create a copy of the obstacle and place it in a new location.
- **Delete:** Permanently remove the obstacle from the layout.
  If you have finished drawing the roof, click Next (bottom right) to proceed to the next step, Environment.

Environment

In this step, you define the environmental conditions that influence the structural calculations of your PV system. These settings are location-dependent, ensuring the design complies with safety standards.

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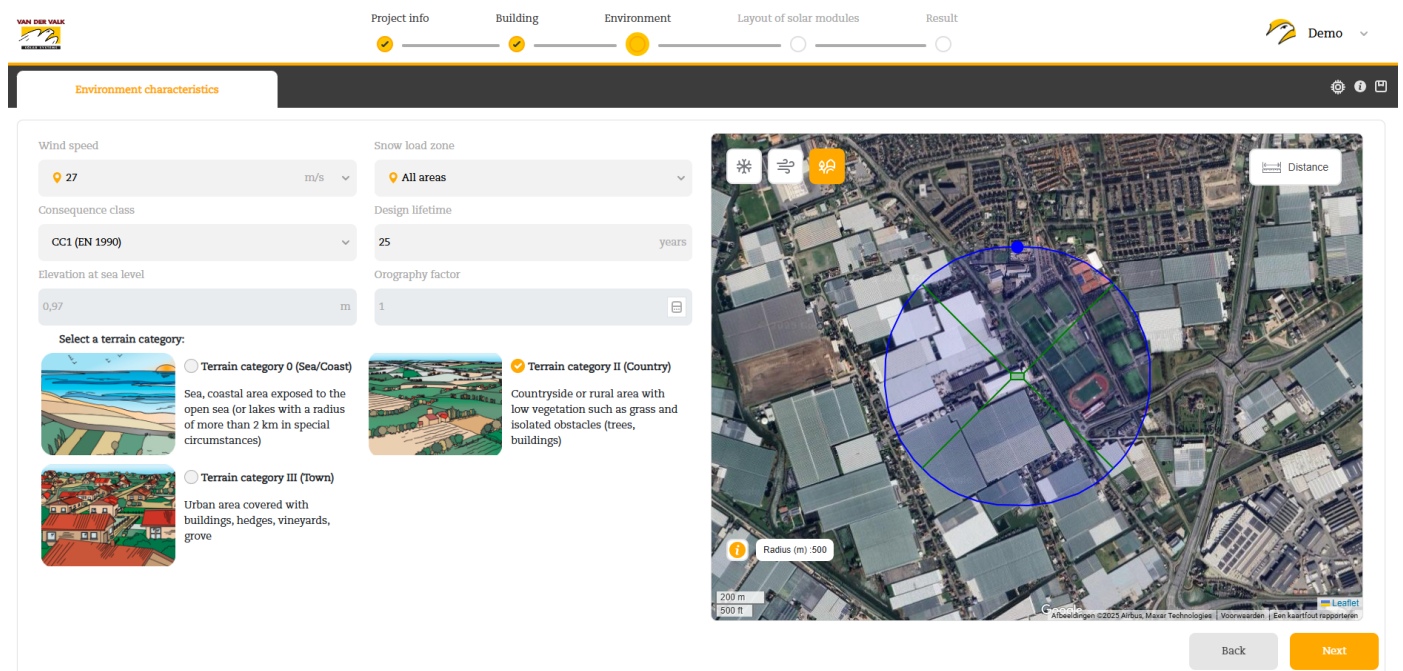
Wind speed:
Select the wind speed for the project location in meters per second (m/s). The available range may vary depending on where the building is located.

Snow load zone:
Select the snow load zone applicable to the project site. Options depend on the project's region, as some areas have higher or lower snow loads.

Consequence class (CC):
Choose the building class according to EN 1990 standards. This indicates the level of reliability required for the structure.
• **CC1:** Low-risk classification (e.g., standard residential).
• **CC2 / CC3:** Higher-risk environments.

Design lifetime:
Specify the expected service life of the structure, in years. The value should follow project requirements or applicable standards.

Elevation at sea level:
Set the elevation of the building above sea level. This value is used in wind and snow load calculations.

Orography factor:
Adjust this factor if the project is located in areas with unusual terrain features such as hills, slopes, or cliffs.

Terrain category:
Based on the project's location, you will see different terrain categories. Choose the one that best matches the surroundings. The definitions for the terrain categories are derived from the Eurocode and National Annexes. The available terrain categories and descriptions can vary per country.

Map view:
On the right side of the screen, the map shows the project location and its surroundings. Use this to confirm the terrain and verify the correct terrain category, wind, and snow zone for your design.

Once all environmental parameters are entered, click Next (bottom right) to continue to the Layout of solar modules step.

Layout of solar modules

This step defines how panels are placed on the roof. Use the left panel to choose your Solar panel and then set the layout using the sections below.

Tip: You can mark a panel as a favourite. Favourite panels will always appear at the top of the list the next time you create or edit a project, making them quicker to access.
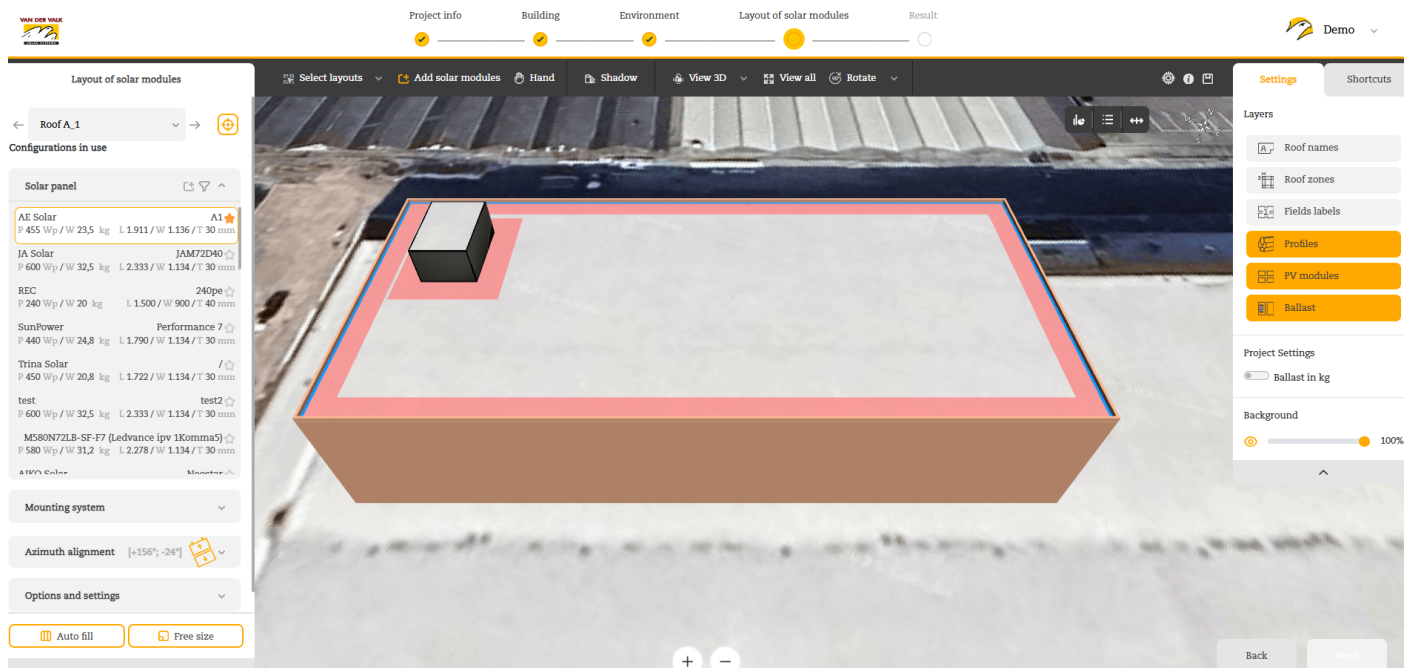
Mounting system

The available settings depend on your chosen options:

- **System setup**
  Choose South or East-West.
- **Module orientation**
  Select Portrait or Landscape.
- **Module tilt angle**
  Select the tilt for the mounting rows.
- **System type**
  Select the mounting series you will use.
- **Pitch [mm]**
  Set row spacing. This controls shading clearance and walkways.
- **Wind deflector (middle zone / edge & corner)**
  Choose Open System or Closed System as required for the roof zones.
- **Fixation method**
  Select Ballast, Anchors, or Hybrid.
- **Foundation type**
  Choose the base used under the system (for example, tile carrier).
- **Ballast options**
  Pick the block size/weight to be used.

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Azimuth alignment

Controls the rotation of the PV module layout relative to the roof. All layouts placed on the same roof use a single shared azimuth angle. To apply a different azimuth, a separate roof surface must be defined and configured individually.

Options and settings

Fine-tune spacing and placement rules.

- **Dilatations**
  Set Horizontal and Vertical gaps. The tool shows the number of modules and row lengths that result.

- **Maximum panel pressures**
  Toggle on if you want the design to respect the module manufacturer's pressure limits. This option allows you to set the maximum permissible load on the solar modules, both downward (front side) and upward (back side). The values are entered in Pascal (Pa) and should match the manufacturer's specifications for the selected module type. Enabling this setting ensures the design respects the panel's load capacity under wind and snow conditions.

Place modules
You can choose how solar modules are placed on the roof:

- **Auto fill**
  Automatically fills the available roof area with modules, taking into account your settings, edge distances, and obstacles.
- **Free size**
  Manually draw or adjust a custom area, and the planner will fill it with modules based on the current configuration.

Editing Module Layouts

After filling the roof with solar modules, you can edit or remove them using the Select layouts tool in the top menu. This provides three options for selecting what you want to adjust:
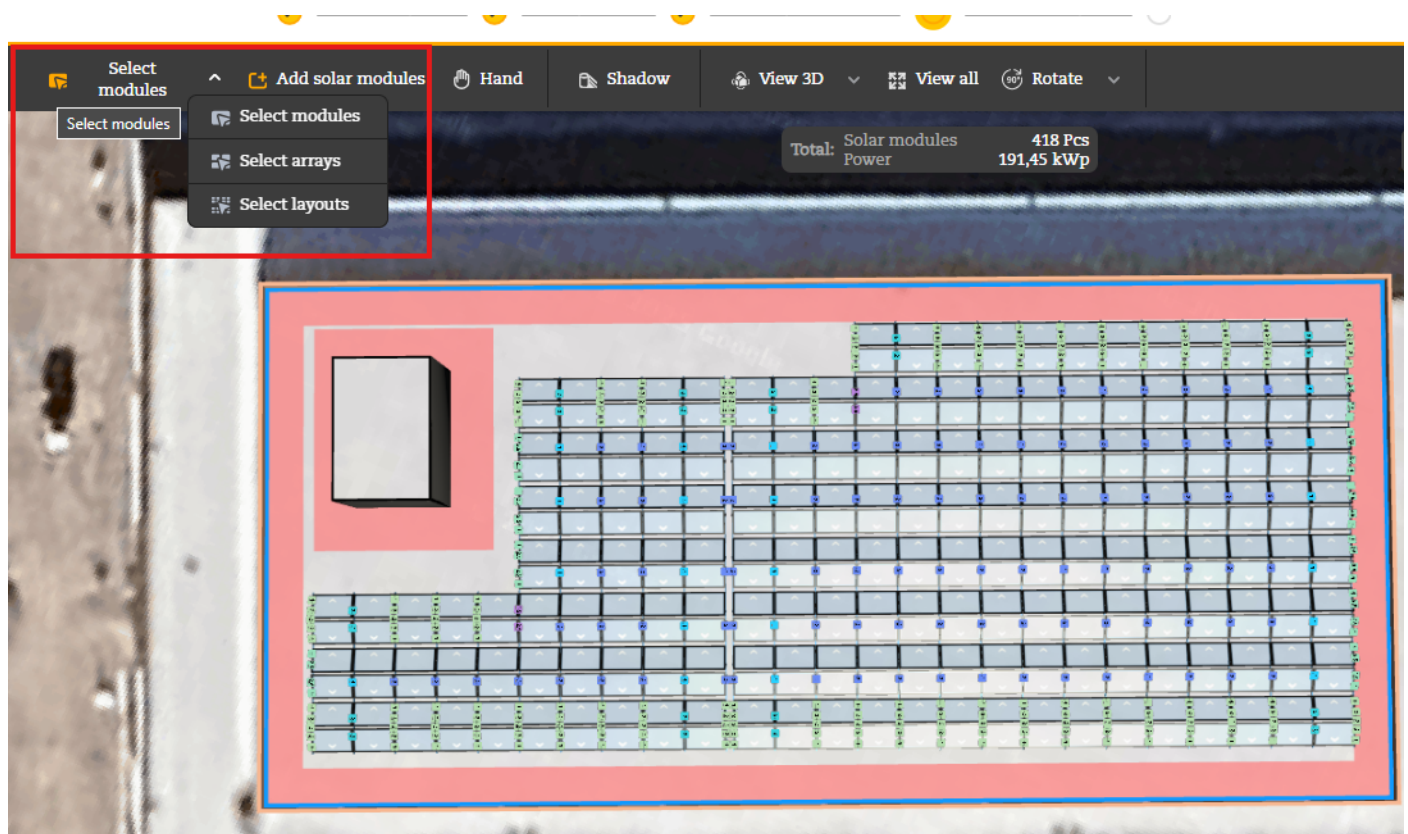
- **Select modules**
  Choose and remove individual modules.
- **Select arrays**
  Select and remove entire module rows or groups.
- **Select layouts**
  Select the complete layout area to clear or adjust all modules at once.

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Adding More Buildings:
In your project, you can also add additional buildings with different configurations.
A new roof can be created in the same way as your first one: select Buildings from the navigation bar at the top and follow the same drawing steps as before.

Results

The Results section brings together the final outcomes of your project. Here you can review calculated values, material requirements, and detailed reports.

Project Overview

The Project Overview page provides a summary of the key results of your design. It shows the most important values such as:

- Module quantity
- Total DC power
- Roof and membrane type
- Total system weight
- Roof height
- Average roof load and weight distribution

	Total	Roof A_1	Roof B
Module quantity	418 pcs	334 pcs	84 pcs
Total DC power	191,45 kWp	151,97 kWp	39,48 kWp
Roof cladding	-	Membrane roof	Membrane roof
Membrane type	-	Bitumen	Bitumen
Total weight	20.195,16 kg	15.353,5 kg	4.841,65 kg
Roof height	-	10 m	10 m
Average roof load	10,31 kg/m²	11,78 kg/m²	8,85 kg/m²
Average weight on PV-system area	21,19 kg/m²	19,14 kg/m²	23,23 kg/m²

This gives you a clear snapshot of the overall system before reviewing more detailed results.

From here, you can continue to the other result tabs: ValkCableCare, Bill of materials, and Project report, each providing additional project details.

Exporting Project

You can also use the Export Project option (top right) to generate and download the project for sharing or documentation.

ValkCableCare

The ValkCableCare tab lists all cable management and accessory items needed for the project. These items are grouped into categories such as BirdBlocker, Cable and connector clamps, Cable baskets, Cable installation tools, Mounting clamps, and more.

Project info   Building   Environment   Layout of solar modules   Result

Demo

| Project overview | ValkCableCare | Bill of materials | Project report |

ValkCableCare

	Item no.		Description	Calc. Qty	Extra. Qty	Total. Qty	Pack Qty.	Price/item	Total
BirdBlocker	756013		BirdBlocker EVO H=125mm	0 0		0	1	250,39	0,00
Cable and connector clamps	756022		BirdBlocker EVO H=200mm - Pre-clipped	0 0		0	1	367,37	0,00
Cable baskets H=35	756023		BirdBlocker EVO H=125mm - Pre-clipped	0 0		0	1	284,52	0,00

Cable baskets H=60

Cable and connector clamps

	Item no.		Description	Calc. Qty	Extra. Qty	Total. Qty	Pack Qty.	Price/item	Total
Cable entry protector	732001		SS cable clamp small	836 0		836	500	0,17	142,12
Cable installation tools	732011		Plastic cable clamp for back foot ValkPro+	460 0		460	125	0,42	193,20
Cable support	732012		Plastic multi-cable clip for roof carrier	418 0		418	125	1,02	426,36
Coupling clamps	738201		Ss. Connector clamp	418 0		418	100	0,53	221,54

Covers

Cable baskets H=35

	Item no.		Description	Calc. Qty	Extra. Qty	Total. Qty	Pack Qty.	Price/item	Total
Equipotential bonding clamp	760203		Zinc- mag coupling cable basket h=35 clip-on	0 0		0	30	2,40	0,00
LPS clamp	76010100353000		Zinc- alu cable basket w=100 h=35 L=3000mm	0 0		0	10	25,63	0,00

Mounting clamps
Mounting clips
PV Inverter shelter
PV Inverter shelter Angled
PV Inverter shelter Mini
Support blocks
Support bracket

Total price gross	€	983,22
Total price net	€	983,22
Total weight Cable Care	Kg	17,976

Back   Next

On the left-hand menu, you can select different categories to view the available items.

Items that are checked are the ones automatically included in the Bill of Materials (BOM) based on your project configuration. You can also adjust the quantities manually if additional components are required.

At the bottom of the table, you will see a summary of the total price and total weight of the selected cable management items.

To proceed, click Next to continue to the Bill of materials tab.

Bill of Materials

The Bill of Materials tab provides a complete list of all system components calculated for your project. This ensures you have an accurate overview of the parts needed for installation.

Project info   Building   Environment   Layout of solar modules   Result

Demo

| Project overview | ValkCableCare | Bill of materials | Project report |

Roof: All roofs

| Mounting system | Additional items | Total BOM |

	Item no.		Description	Calc. Qty	Extra. Qty	Total. Qty	Pack Qty.	Price/item	Total
All segments	724650		Alu rear foot ValkPro+ L10° middle	376 0		376	25	8,89	3.342,64
1	724651		Alu rear foot ValkPro+ L10° side	84 0		84	25	9,61	807,24
2	724660		Alu front foot ValkPro+ P/L10° middle	376 0		376	25	5,72	2.150,72
3	724661		Alu front foot ValkPro+ P/L10° side	84 0		84	25	6,95	583,80
	725150		Alu. ballast wing ValkPro+	148 0		148	200	3,77	557,96
	729622		Rubber tile carrier - click - ValkPro+	574 0		574	30	5,91	3.392,34
	729634		Load distributor ValkPro+	201 0		201	60	5,91	1.187,91
	741801400		Galv. roof carrier L=1400x1,5mm	96 0		96	100	16,59	1.592,64
	741802500		Galv roof carrier L=2500x1,5mm	182 0		182	100	25,76	4.688,32
	742512		Galv back plate ValkPro+ L10° L=1980mm	84 0		84	100	16,80	1.411,20

Colour configuration

Black | Grey

Comment...

Discount: 0 %

Total price gross	€	20.361,16
Discount	€	0,00
Total price net	€	20.361,16
price / module	€	48,71

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Roof and segment selection
On the left-hand side, you can choose to display the BOM for:
• All roofs combined,
• A specific roof, or
• Individual roof segments.

This is useful when a project contains multiple roofs or when a single roof is divided into segments.

Component tables
The BOM is divided into three tabs:
• **Mounting system**
  Lists all calculated components from the system configuration (such as carrier rails, feet, ballast, deflectors). Quantities are automatically filled in based on your design.
• **Additional items**
  Contains optional or supplementary parts that can be added if needed, such as fasteners, drainage clips, side plates, or alternative ballast options. Items with 0 calculated quantity can still be included manually by entering an extra quantity.
• **Total BOM**
  Shows a combined list of everything included in both the Mounting system and Additional items tabs. This provides the final overview of all quantities, packaging, and costs that will be included in the export.

Adjusting quantities
To adjust, you can either use the up and down arrows or enter a value in the Extra Quantity column: use a positive number to increase and a negative number to decrease the quantity.

Additional options
At the bottom of the page, you can configure:
• Colour configuration (for example, Black or Grey),
• Comments for internal notes,
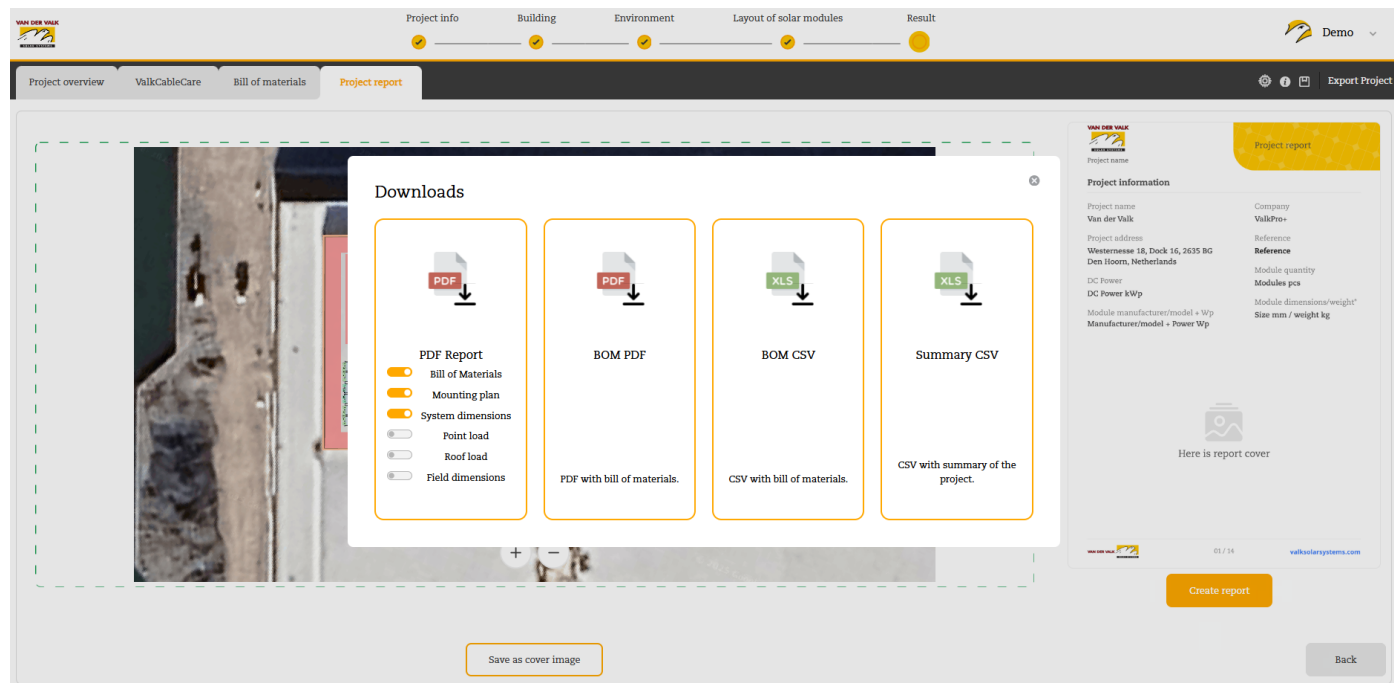• Discount (%) if applicable.

Summary
A cost summary is shown at the bottom right, including:
• Total price gross
• Discount
• Total price net
• Price per module

Once reviewed, click Next to continue to the Project report tab.

Project report

The Project report tab is the final step of the workflow, where you generate and download the full project documentation.

To begin, click Create report. Once the report is generated, different download options will appear:

- **PDF Report**
  A customizable document where you can include or exclude sections such as:
  o Bill of Materials
  o Mounting plan
  o System dimensions
  o Point load
  o Roof load
  o Field dimensions
- **BOM PDF**
  A PDF version of the Bill of Materials only.
- **BOM CSV**
  An export of the Bill of Materials in CSV format, suitable for spreadsheets and further processing.
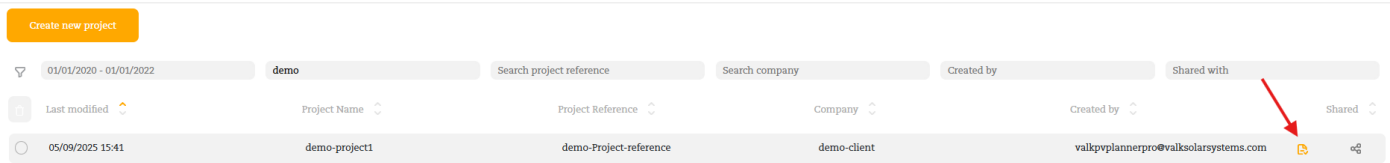- **Summary CSV**
  A CSV with a summary of the overall project data.

Cover image
You can also select and save a cover image (for example, the project's satellite view) to appear on the front page of the PDF report.

4. Quick Access to Project Report

From My Projects, once a project is fully completed and all steps are finished, a report icon becomes available. By clicking this icon, you can directly open the project report without navigating back through the workflow. This provides a quick way to access the report and saves time if you need to open it again later.

5. Sharing a Project

Projects can be shared with colleagues or partners directly from the My Projects page.
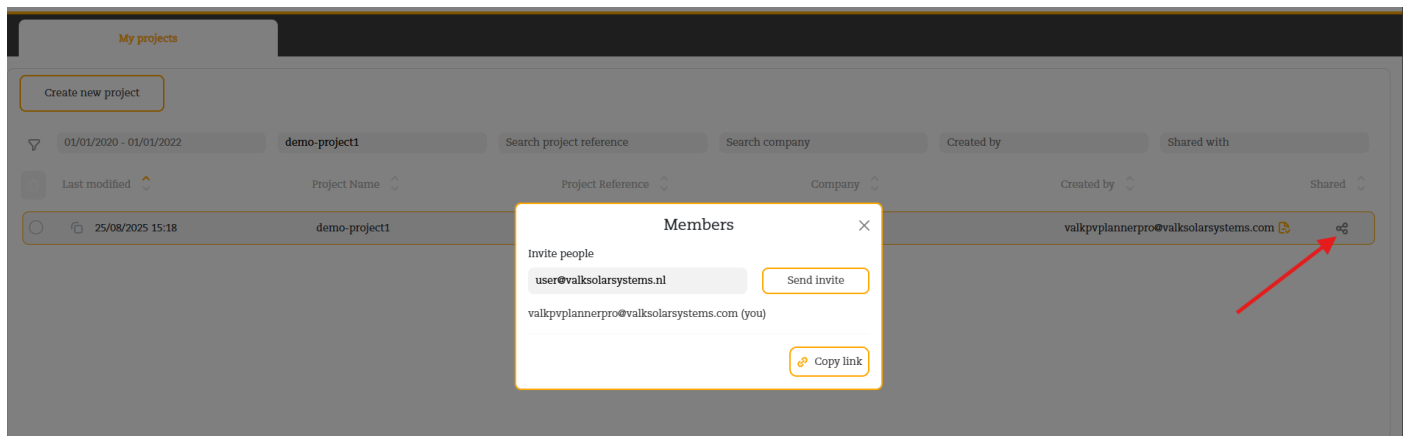
1. Locate the project you want to share.
2. Click the Share icon on the right side of the project row.
3. In the pop-up window, you have two options:
    o **Invite by email:** Enter the recipient's email address and click Send invite.
    o **Copy link:** Generate a shareable link that you can send manually.

The invited users will then gain access to the shared project and can view or continue working on it, depending on their access rights.

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