

Solergo allows the complete design of grid-connected and stand-alone photovoltaic systems, developing the required documentation.

Generality

Job order management, network projects sharing, backup and recovery. Saving the project to EG Cloud and sharing documentation.

Management of user profiles for conditional access to the common database and library. Management of interface styles (dark theme) and HDPI screens.

Subjects

Definition of the plant responsible and the technical manager. Management of subjects identity database.

Climatic data

Climate database according to UNI 10349-1:2016 or ENEA table.

International climate database with all countries of the world.

Editing climate database and importing climatic data from PVGIS of the climatic data and of the horizon profile with calculation of the producibility.

System definition

Location and characteristics of the system. Acquisition of position, coordinates and satellite view from Google Maps.

Expansion of PV plant.

Fixed installations, or installations with tracking device with one, two axes or tilted axis.

Defining the conditions for albedo, with detail even monthly.

Analysis of azimuth and inclination of the panels in fixed installations.

Determining average irradiance according selected climate data.

3D model

Generation of the 3D model of the installation site, with extrusion and solid modeling functions. Definition of the laying areas and obstacles on the 3D model.

Preview, on the 3D model, of the energy performance on the various laying areas.

Analysis of losses due to shading, deduced from the 3D model.

Rendering of the system with related reporting of the generated images.

Shading

Automatic drawing of the shadows chart, built with digital photos of the horizon seen from the installation site.

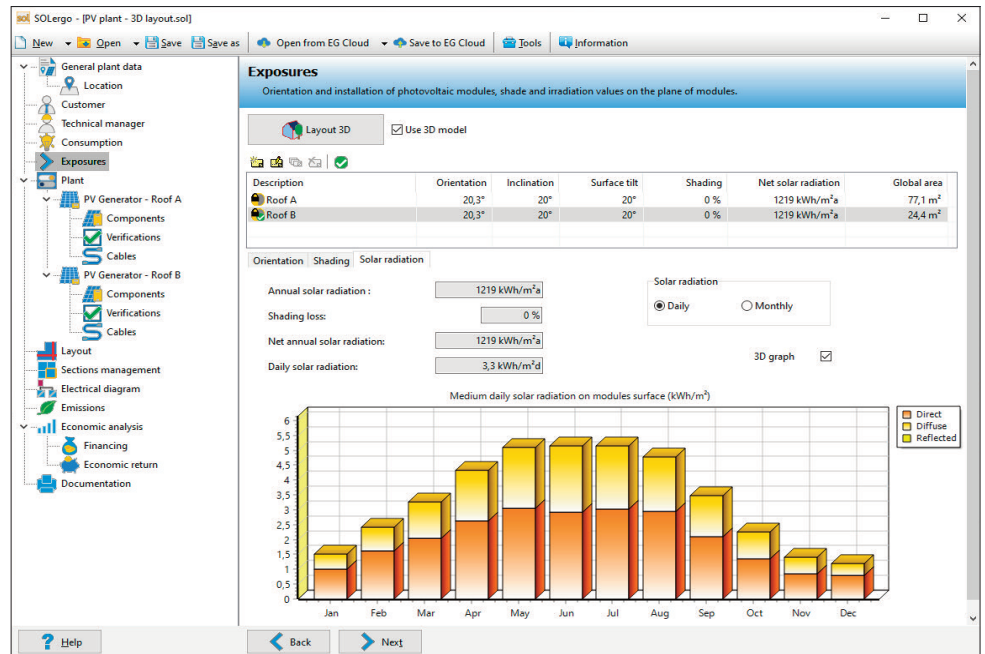
Editing the chart to place additional elements (future obstacles, trees).

Evaluation of mutual shading between strings with representation on the shadow diagram. Calculation of energy loss due to shading.

Definition of close obstacles such as chimneys, antennas, balustrades, manufactured in close proximity.

Shadow casting of close obstacles, not coplanar also, on the laying of photovoltaic modules.

Calculation of the energy loss due to close obstacles by study of the PV module according to model with bypass diodes, considering the cleanness of the site.



Database

Large, editable and extensible archive of photovoltaic panels of several technologies.

Complete archive of single phase and three phase, multi-inputs and multitrackers inverters. Management of inverters with multiple trackers and different characteristics between them.

Definition of the performance characteristics of the inverter according to the European model with weighed returns.

Hybrid inverters with dedicated storage systems. Catalogue of cables, protections, SPD, transformers typically used in photovoltaic systems and its electrical characteristics.

All database are fully editable and extendable by user data input and installation of update packages published by Electro Graphics (see the download area of the web site).

Power optimizers

Management of photovoltaic power optimizers (eg SolarEdge or similar).

Management of inverters for optimizers. Energetic and economic calculation updated to the use of optimizers.

Photovoltaic generator

Calculation of the actual radiation incident on the PV modules. Splitting into sub-generators mutually independent.

Choosing of panels, arranging strings and coupling with inverters.

Management of double-sided photovoltaic modules and calculation of the energy gain resulting from their use in the defined installation conditions.

Calculating losses by thermal effect on the PV modules (Evans formula).

Evaluation of losses due to mismatch and conversion.

Determination of the energy producibility of the system in standard operating conditions.

Evaluation of the net and total used area.

Sections of system

Management of systems arranged in several sections, each one consisting of generators, with different integration also and with different activation dates.

Inverter configuration

Inverter selection based on criteria of economic and energy optimization.

Coupling of strings analyzing different possible combinations according to the characteristics of the inverter trackers (MPPT).

Assignment of strings with homogeneous exposure to the same tracker.

Search filters for manufacturers and typologies.

Protections

Setup of protections on DC and AC side (main device, interface device and its protection).

Setup of protection against external overvoltage (SPD).

PV system layout

Importing of the general plan as dwg, dxf or raster.

Definition of areas of installation of the modules on images also downloaded from Google Maps. Automatic and parametric insertion of modules on defined areas with possible any exclusion areas inside.

Automated placement of strings and modules on the plan, according to defined arrangement, spacing and orientation.

Drawing of string boxes, field panel, joining strings panel, inverter, parallel inverter panel, measurement panel and delivery point.

Automatic identification of cable pathways with their measure for the dimensioning of electrical cables and conduits.

Summary table of the used equipment (main data, PV modules and inverters).

Detailed table of the string connection.

Exporting the plant layout as dwg.

Integrations

Ampère Professional, Ampère Evolution: calculation of electrical grid.
 CADelet Impianti, Eplus: electrical system engineering.

CADelet Schemi, iDEA: wiring diagrams for industrial automation.
 CADelet Professional: electrical system and wire diagrams engineering.



Cable sizing calculation

Calculation of cables according to IEC-UNEL, NF, UNE, BS or NBR tables, AC and DC low voltage. Determination of voltage drops and losses for dissipation.

List of cables by function and type.

Electrical diagram

Single-line electrical diagram of the system according to CEI 02, with signs and assets definition according to CEI 82-25, with power delivery in LV or MT.

Title block and legend of symbols.

Exporting Single-line diagram as DWG, compatible with CADElet, Eplus and iDEA.

Polluting emissions

Calculation of the equivalent amount of fuel saved in TeP, with consequent reduction of greenhouse gas CO² and pollution (SO², NO_x and particulates).

Estimation

Estimation of system cost in its various components: pv modules and supports, inverters, cables in various types, electrical panels and protections, accessory works, design costs.

Total economic estimation, with possibility of price or cost evaluation and determination of the contribution margin.

Incentivation

Setting and definition of any incentive fee, depending on the type and power of the system. Managing of energy sales rates, fees and ancillary costs.

Consumption analysis

Database of typical power loads in domestic and residential areas.

Definition of loads according to types (continuous, intermittent, depending on the user) and their performance over the time.

Management profile of consumption by aggregation of loads.

Energy analysis of the system hourly or at intervals of 15 minutes with possible use of consumption data provided by distributors on .xls file. Analytical determination of the simultaneity factor, in relation to the diagram of energy production and the consumption profile.

Accumulation systems

Definition of the accumulation system, with simulation of profitability in order to determine the optimal accumulation power.

Management of systems with one-way or two-way AC or DC side storage systems.

Electric rates of consumption

Management of typical rate plans, based on level of consumption and time bands.

Complete data for rates in the enhanced protection market (D1, D2, D3, etc.) (for Italy only).

Complete editor of rates, both for consumption bands and for time band (up to three).

Payback

Evaluating of additional costs for maintenance or extraordinary work during the life of the system. Assigning indices of inflation and discounting for ratings of future scenarios.

Determination

of the incentives, and revenues from energy sales.

Management of compensation system according to ANEEL Resolution 482 for systems installed in Brazil.

Evaluating the investment in financial terms based on personal and / or financed capital, and pay-back period. Calculation of the period of return of the own investment (repayment period or pay-back).

Diagram of cash flow during the life of the system.

Determination of indices of economic evaluation of investment such as NPV, IRR and compound rate of return.

Analysis of profitability by comparing solutions with own financing, third party or mixed financing and leasing.

Technical datasheet

General report of the project with description of the plant, radiation data, expected energy production, followed method of calculation, diagrams, lists of equipment, plant layout and references.

The standard template and the report can be customized and exported to Microsoft WORD; they are available in Italian, English and Portuguese.

Technical datasheet of the system.

Economic report

Economic report with all the components of cost, revenue and incentives.

Details on the profitability ratios and charts.

Document management

Availability of document template for the connection and activation request, with relative operating regulations.

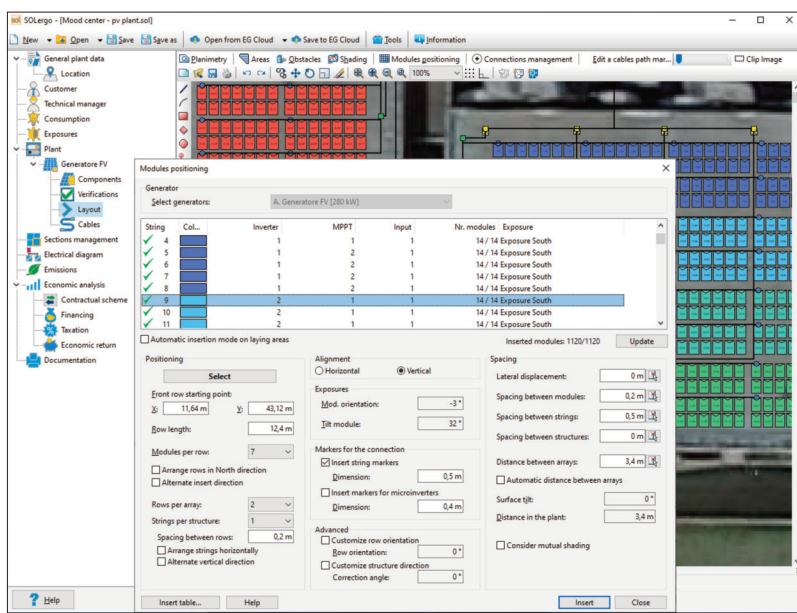
Test certificate, serial number table and various declarations.

Editor for templates in Word format, directly correlated with all project data.

Generation and concatenation of all documents on PDF files.

Interoperability

Interfacing with software Ampère Professional and Evolution to analyze the



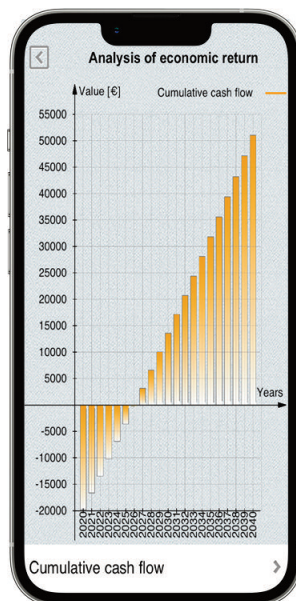
electrical network of the PV generator. Interfacing with software CADElet, Eplus or iDEA for the drawing of the system and its construction details.

Stand-alone plants

Management of stand-alone plants, with analysis of expected consumption, calculation of the battery capacity and its charge controller. Choice of the storage battery, charge controller and / or inverter, from database.

Stand-alone hybrid system with auxiliary generator

Designing of hybrid stand-alone system, so a stand-alone system with an auxiliary generator, which aims to supply the load when the photovoltaic system and the battery can not charge enough. It can have all DC loads or all AC loads and an auxiliary generator.



iSolergo: preliminary PV design in smartphones and tablets

Free app for iOS® and Android® smartphones and tablets, available in the App Store or Google Play, that allows a preliminary design of PV system, with energy analysis, configuration of PV modules and inverters and evaluation of plant profitability.

All elaborations are presented in charts and tables easily understandable.

The project data is saved as Solergo standard file and it can be sent via e-mail to the desktop pc, where the final design and all related documentation can be developed in Solergo.

In a similar way, a Solergo file sent by email from the desktop pc to the mobile device (tablet or smartphone) can be opened and edited in iSolergo.

System requirements: Computer with 3 GHz or higher processor. At least 8 GB RAM. Hard disk with at least 6GB free space. 1024x768 screen resolution. USB port, mouse, printer or plotter. 64-bit O.S. Windows 10 or 11.