Updates and improvements in the latest PVsyst versions

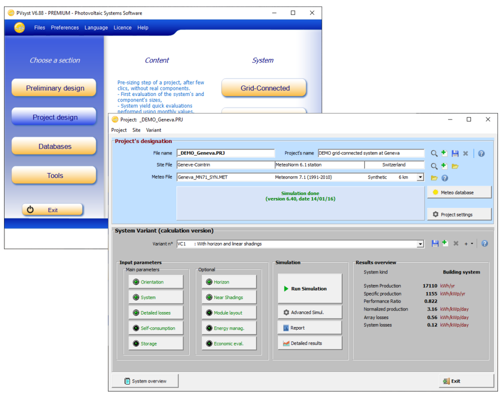
PVPMC Workshop
23,24 August 2022
Salt Lake City, USA

B. Wittmer on behalf of the PVsyst development team
PVsyst SA, Switzerland

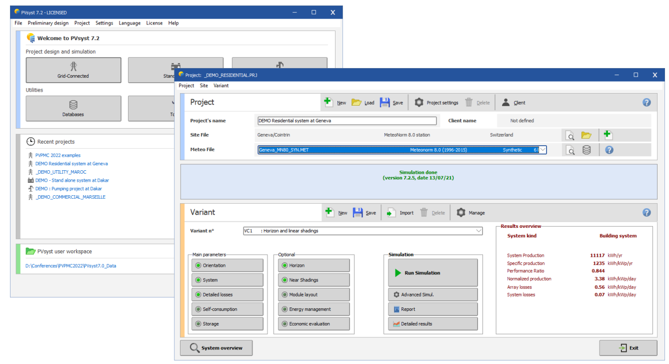
PVSYST SA - Route de la Maison-Carrée 30 - 1242 Satigny - Suisse
www.pvsyst.com

Overview

- Last PVsyst presentation at a PVPMC workshop was in 2019 -> PVsyst V6.8.0



- Today we are at PVsyst V7.2.17

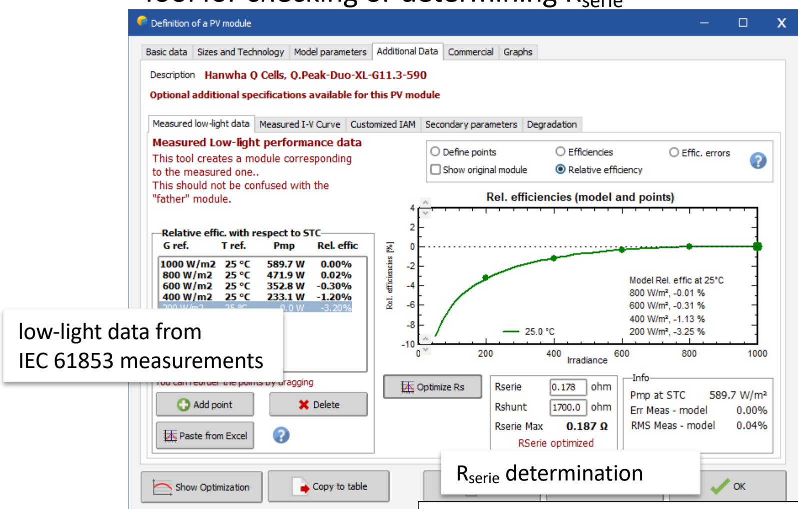


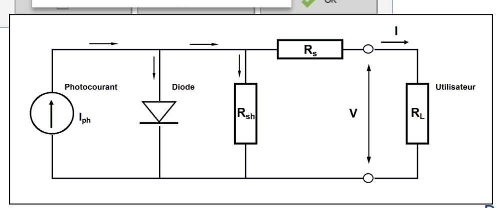
Many novelties and improvements have accumulated, here we briefly cover:

- **Improvements in modeling**
- **Improvements in tools**
- **Improvements in user interface**
- **Upcoming features**

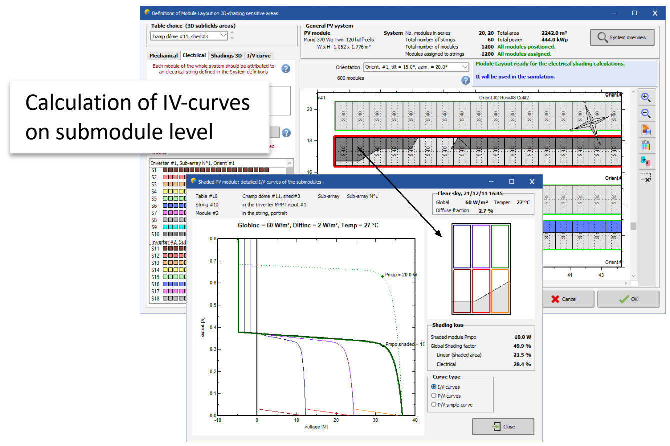
Improvements for PV components

- Improved user guidance for the creation of new PAN and OND files
- Tool for checking or determining R_{serie}





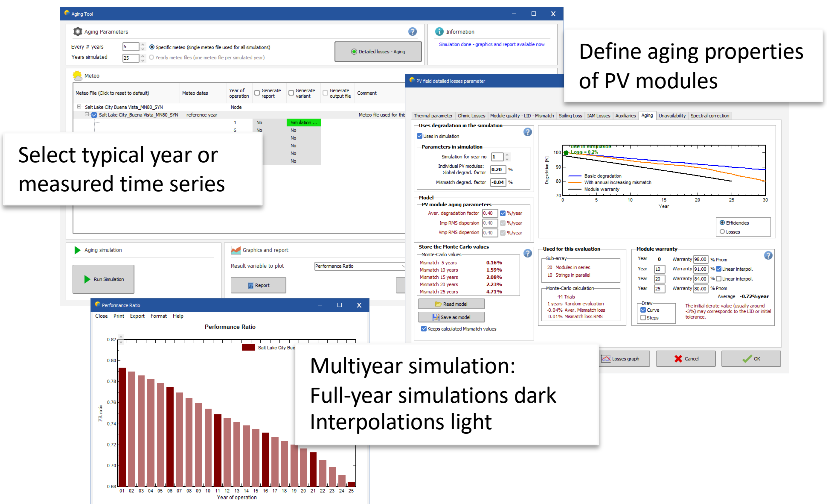
- Twin half-cut cell modules in 'Module Layout'



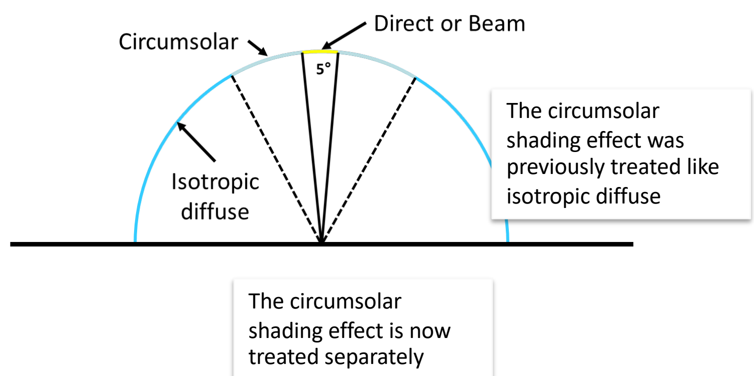
- Power optimizers:
  more manufacturers
  improved modeling

Aging Tool and Transposition

- Multi-year simulations with PV module degradation

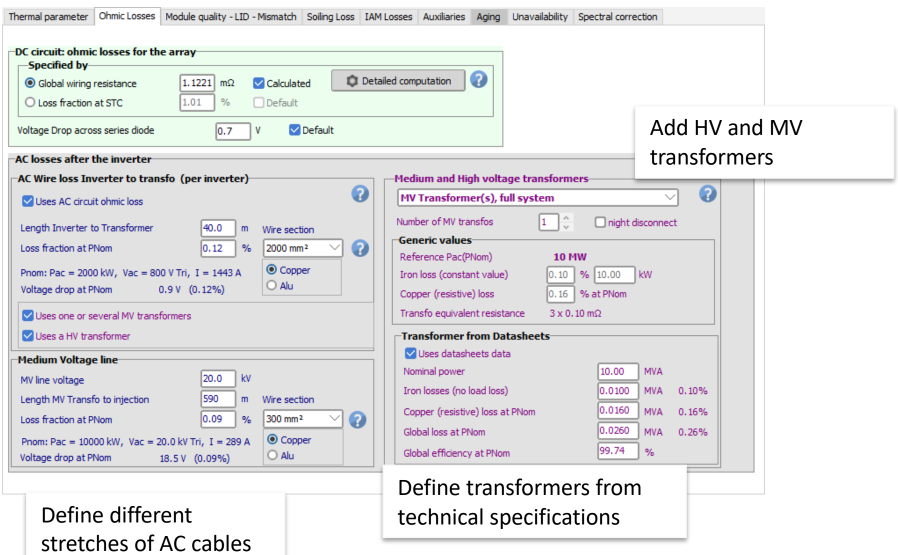


- Explicit treatment of circumsolar irradiance

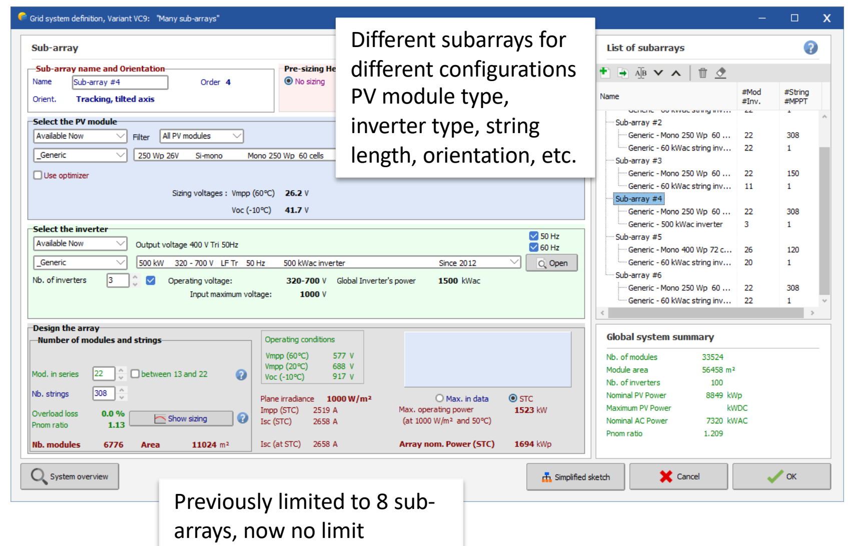


More flexibility for the System design

- More detail in AC circuit

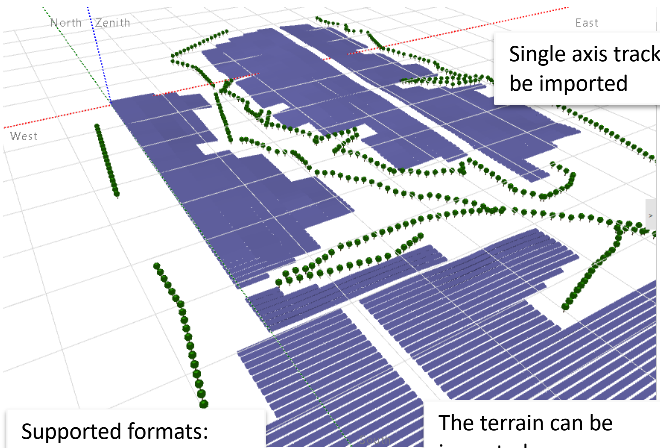


- Unlimited number of sub-arrays



Shadings on complex terrain

- Importing of 3D drawings (including trackers and terrain) from other software packages



Single axis trackers can be imported

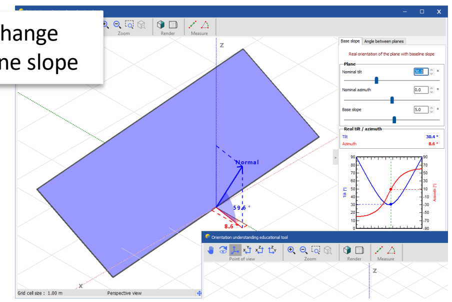
Supported formats:
DAE, 3DS, H2P, PVC

The terrain can be imported

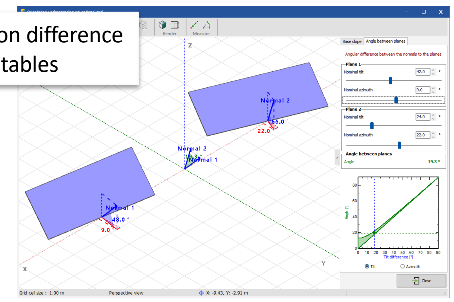
PVC format based on open-source Collada (DAE) with additional keywords to describe PV tables and trackers

- Visualization tools for understanding orientations

Orientation change due to baseline slope

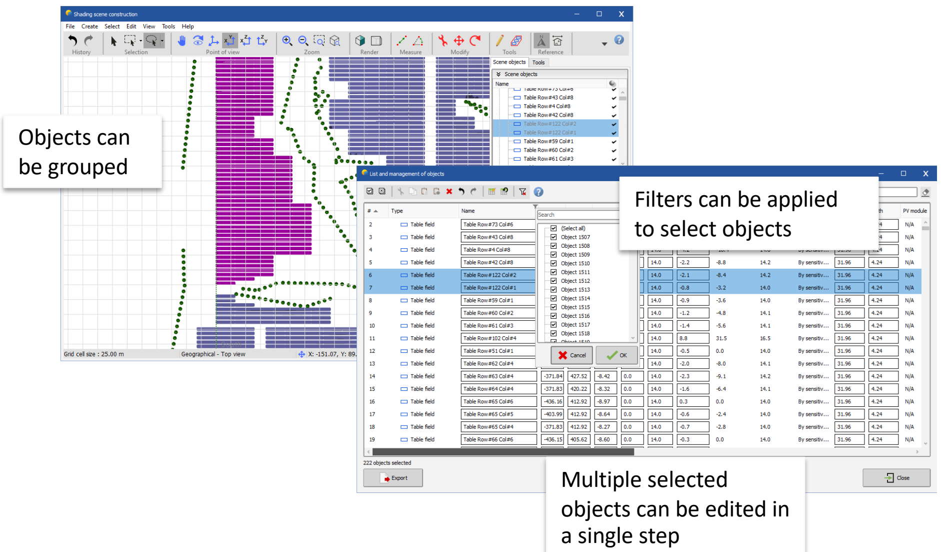


Orientation difference between tables

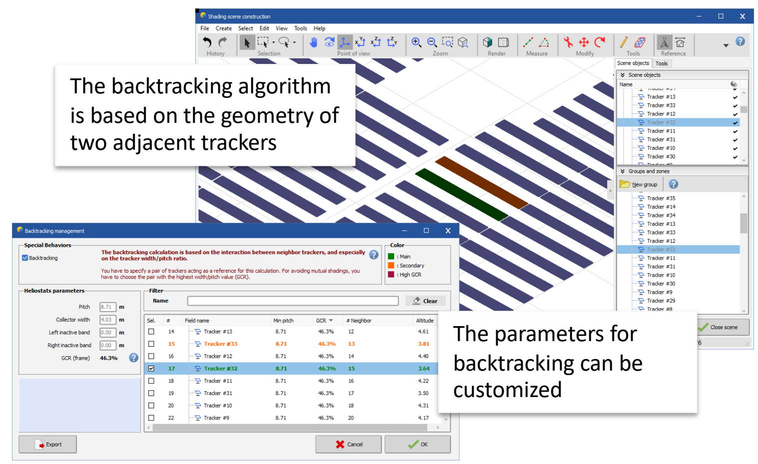


Advanced Editing Tools

- Multiple selection editing

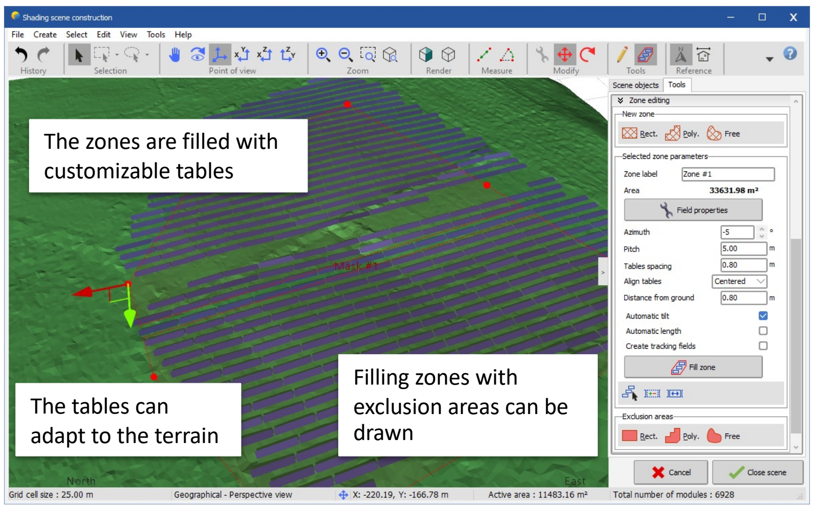


- Improved Backtracking definitions

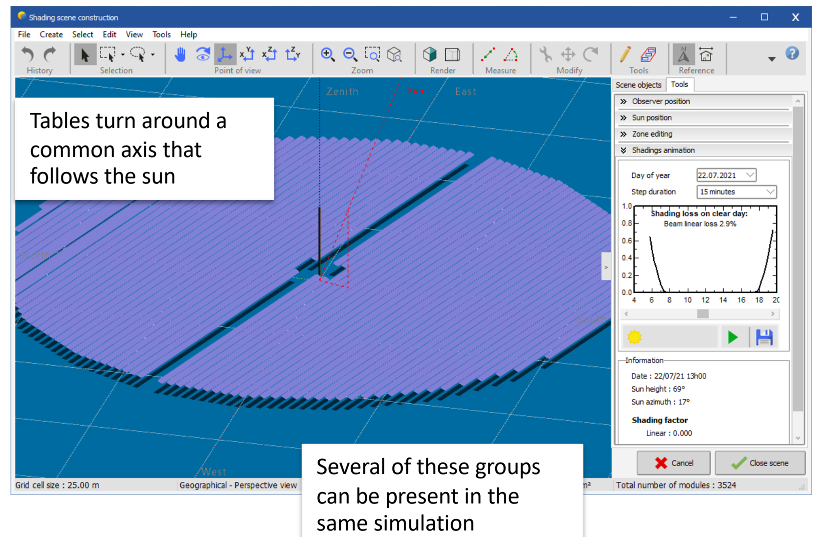


Improvements in 3D drawing tools

- Filling zones with automatic height adjustment
- Tracking systems with a single or several common vertical axes (floating PV)

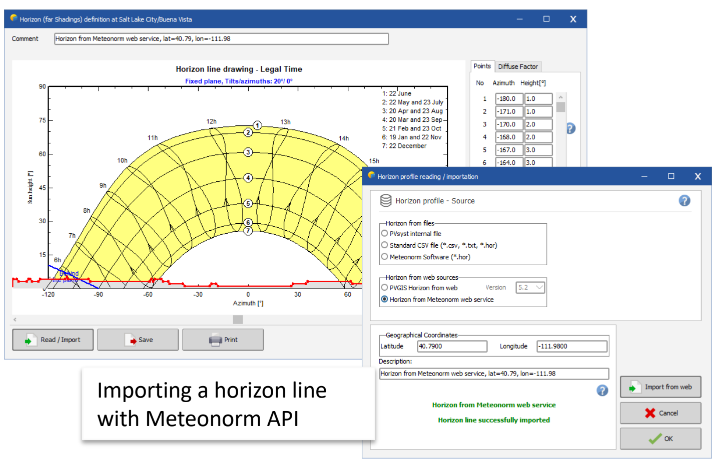


The tables can be fixed tilt or SAT

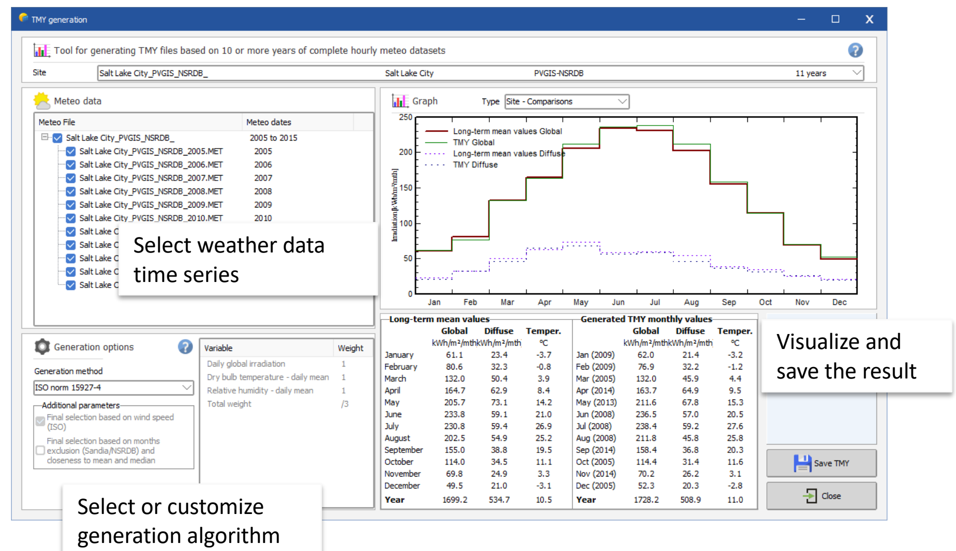


Weather data

- Updated weather data sources:
  Meteonorm 8 built-in (prepared for sub-hourly data)
  Meteonorm API for horizon import
  Solcast API
  SolarAnywhere API
  SolarGIS API (upcoming)
  PVGIS API (5.2) including multi-year time series and horizon

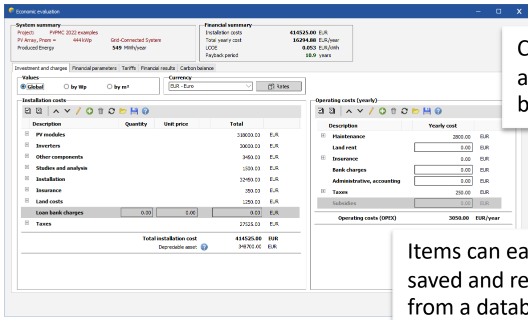


- TMY generation according to several standards



Overhauled Economic Evaluation

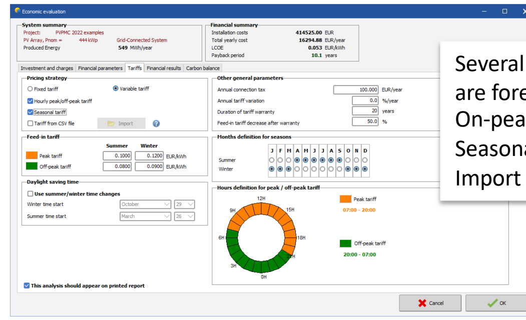
- Fully customizable cost breakdown



Custom items can be added to the cost breakdown

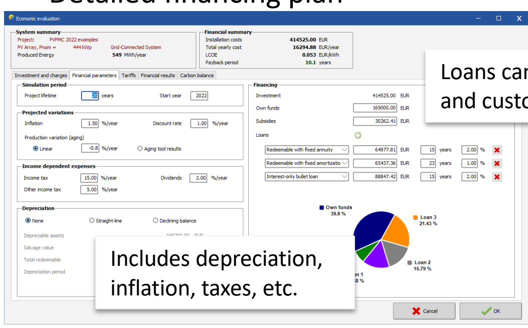
Items can easily be saved and retrieved from a database

- Flexible tariffs



Several levels of detail are foreseen:
On-peak/off-peak
Seasonal variations
Import of hourly tariffs

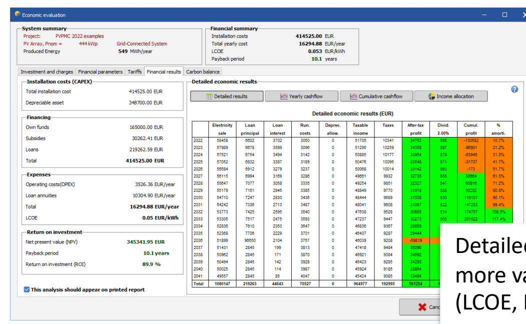
- Detailed financing plan



Loans can be added and customized

Includes depreciation, inflation, taxes, etc.

- Detailed results

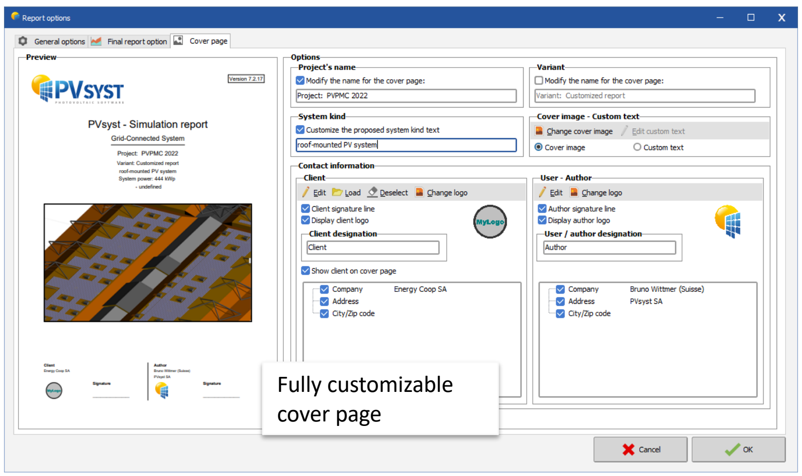


Detailed analysis with more variables (LCOE, NPV, ROI, etc.)

- Includes also self-consumption, storage
- Extended to standalone and pumping systems
- Integrated into batch simulations and optimization tool

General Improvements of User Interface

- Overhauled report with many possibilities of customization

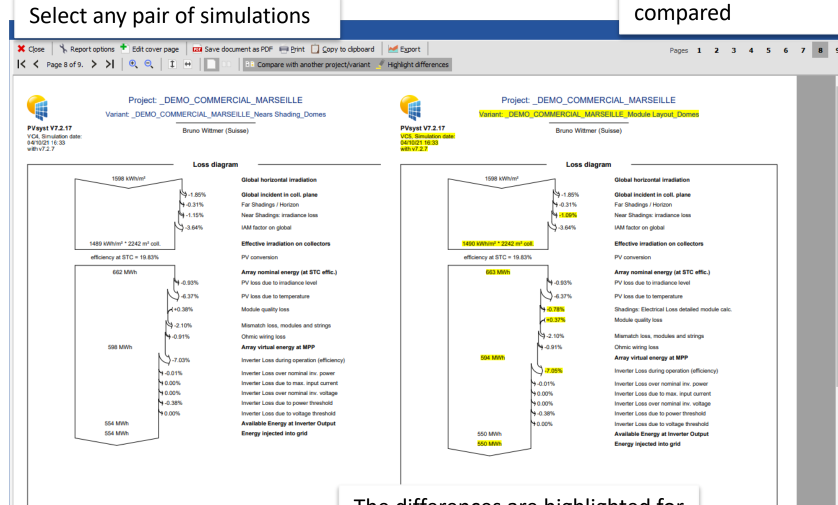


Fully customizable cover page

- Direct comparison of two simulations

Select any pair of simulations

All pages of the report are compared

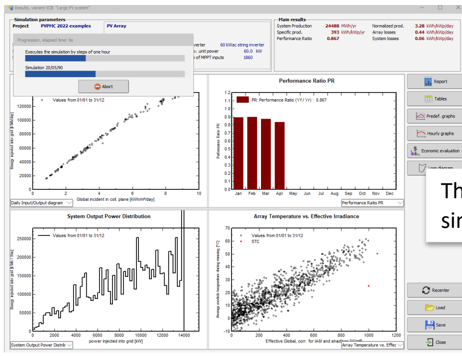


The differences are highlighted for quick identification

- Renewed look of user interface in release 7.0

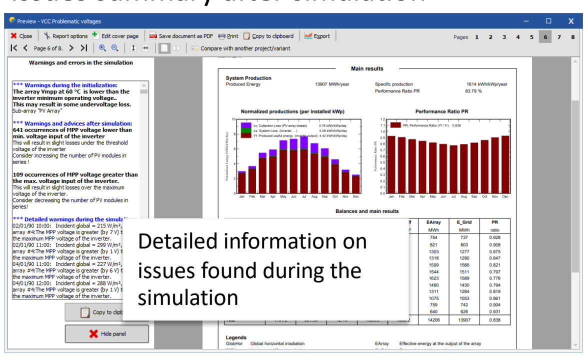
Improvements of User Interface

- Direct feedback during simulation



The results build up as the simulation progresses

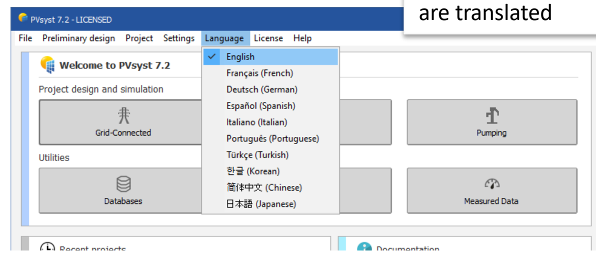
- Issues summary after simulation



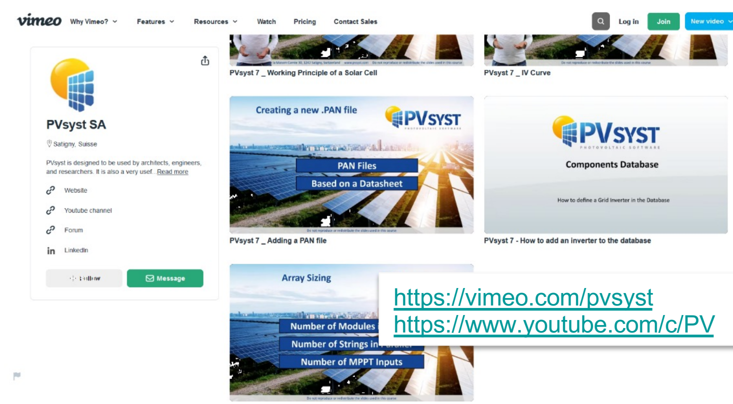
Detailed information on issues found during the simulation

- More Languages

User interface and report are translated



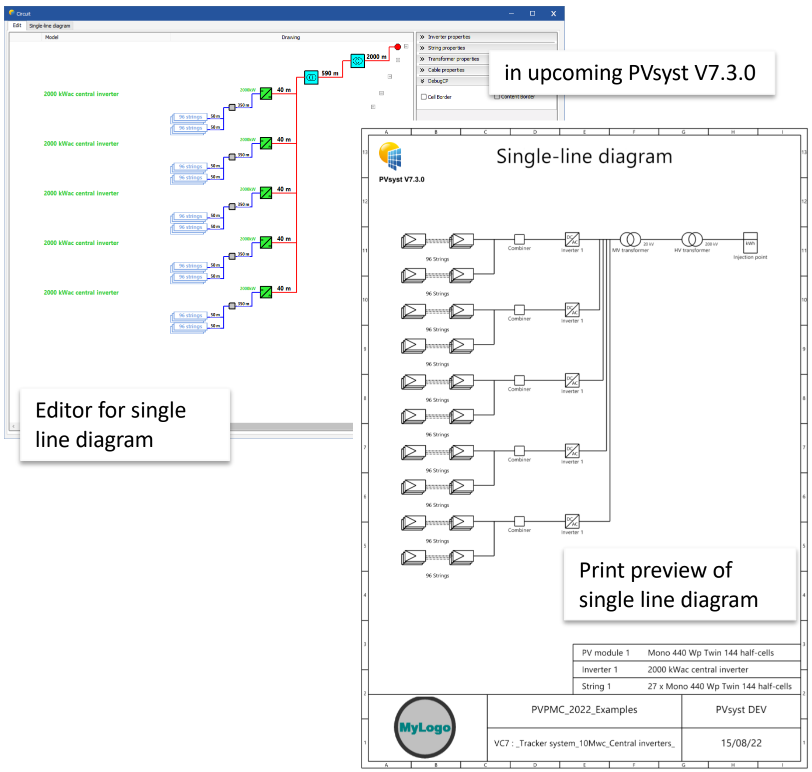
- Tutorials on YouTube and Vimeo



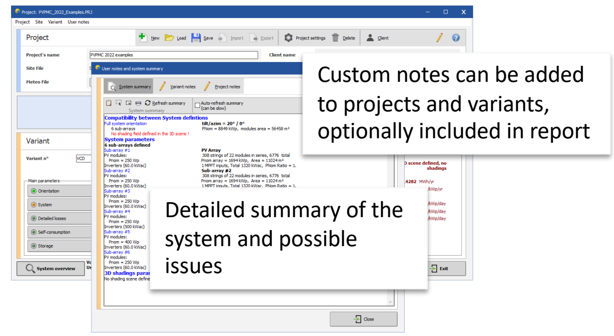
https://vimeo.com/pvsyst
https://www.youtube.com/c/PV

Upcoming features

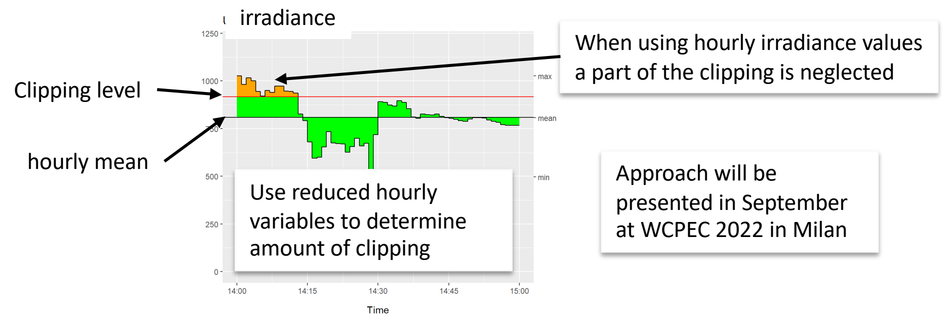
- Single line diagram



- System summary and notes



- Sub-hourly clipping losses



- More flexibility with orientations in a simulation
- Generalized bifacial model

Summary

Many novelties and improvements have accumulated we have briefly shown:

Improvements in modeling

- PV components
  Detailed modeling of Twin half cell modules
  Easier creation of PN files and determination of single diode model parameters
  Power optimizers: more manufacturers and improved modeling
- Transposition
  Explicit treatment of circumsolar irradiance
- System design
  More detail in AC circuit
  Unlimited number of sub-arrays
- Weather Data
  Updated weather sources
  Integrations of APIs for weather data and horizon lines
  Tool for the creation of TMY files

Improvements in tools

- Aging Tool
  multi-year simulations with PV module degradation
- 3D editor
  Importing of drawings including terrain and trackers
  Editing of multiple selections
  Customization of backtracking
  Automatic filling zones
  Trackers with common vertical axis (used for floating PV)
  Tool to visualize orientations
- Overhauled Economic Evaluation
  Fully customizable cost breakdown, financing plan and tariffs
  Detailed financial analysis
  Integration into batch simulations

Improvements in user interface

- Overhauled report
- Direct comparison of two simulations
- More languages
- More details during and after simulation
- More video tutorials

Upcoming features

- Single line diagram
- System summary and notes
- Sub-hourly clipping losses
- More flexibility for complex orientations
- Bifacial systems: current 2D modeling generalized to 3D drawing