PVsyst Simulation Guidelines

*Applicable to PowerFLEX® and PowerFLEX®+ modules. Based on PVsyst version 6

PVsyst is an industry-standard modeling software package to evaluate PV systems. The following guidelines will ensure proper installation and use of the PowerFLEX® series PV module PAN files in PVsyst.
Refer PVsyst tutorial pdf if you need any further help using the PVsyst software.

KEY NOTES: 'Detailed Losses' section

- *'Thermal Parameter'* – For modules adhered directly to a roof with no air gap, select 'Integration with fully insulated back' checkbox
- *'Soiling Loss'* - Select default 3% for any project, if monthly values are unknown
- *'IAM Loss'* – Set ASHRAE parameterization to 0.03 for PowerFLEX series modules

Install the PowerFLEX® series PV module PAN files into PVsyst module library

- If you have the required PowerFLEX® or PowerFLEX®+ modules in the 'Databases>'PV Modules' in PVsyst, you can skip this topic.

- Download our PowerFLEX® series module PAN files from our website using this link www.globalsolar.com/downloads
- Copy the PAN files into the following directory in your computer:
  <PVSYST Home directory> PVsyst<version>_Data\ComposPV\PVmodules
- The file can be verified by going back to PVsyst and 'Databases'>'PV modules'.

Create and evaluate a PV project

- Create a new Project in PVsyst using standard procedure.

Orientation

- Measurements from the actual roof will enable the most accurate simulations. Even though flat roofs can have tilt from 2° to 8°, a good estimate for a flat roof is 'Tilt' = 0° and Azimuth can be left at 0°. Note: For azimuth, South is 0° in PVsyst.

System

- Click 'System' and 'Select the PV module' and 'Select the inverter' from the drop down boxes based on system size.
- It is safe to design higher instead of lower than system size requirement.
- Pnom ratio is typically kept between 1 and 1.15. Choose the right inverter by trial and error to get the preferable Pnom ratio.

Detailed Losses

- Click the 'Detailed Losses' in the System Variant section.
- For a good simulation you can customize the losses based on the project.

a. Thermal parameter:

- By 'default', the PVsyst chooses 'Semi-integrated with air duct behind'.
- When modules are adhered directly to a roof with no air gap, select 'Integration with fully insulated back' checkbox. Metal roof with air flow behind the roof keeps the modules cooler and so is an exception - in that case, you can let it be in the 'default' setting.

b. Soiling Loss:

- Accurate results can be obtained by defining monthly values for soiling.
- For a good estimate select the default 3% by checking 'Default' check box.

c. IAM Losses:

- Global Solar PowerFLEX® series modules are flexible and come with high transmission solar film topsheet instead of rigid glass. This enables less reflectivity when the sun is not directly facing the modules, which is about 80% of the time during day.
- Hence, instead of the default value in PVsyst which is set for the major market c-Si modules that come with glass topsheet, we recommend setting Ashrae parameterization to 0.03. This is based on the test results conducted at an independent lab Fraunhofer CSE in Boston [1].

Run Simulation and generate Report

- Generate the energy production estimate by clicking ‘Run Simulation’.
- A detailed report can be generated by clicking the ‘Report’ button.

PVSyst result is conservative mostly and even with accurate input parameters for any specific location PVSyst can underestimate the actual production by as much as 7% [2]. A quick comparison may be made with other simulation software like PVWatts which is a free online tool from NREL.

Reference

[1] High Angle Of Incidence (AOI) Performance of ICI PowerFLEX®+ - Global Solar Energy 2017

[2] PV Performance Modeling Methods and Practices Results from the 4th PV Performance Modeling Collaborative Workshop – IEA 2017