SAND2019-10418C

Making the Most of Module Matrix Measurements IEC 61853-1

2019 EU PVSEC, Marseille, France

Anton Driesse
PV Performance Labs, Freiburg, Germany
anton.driesse@pvperformancelabs.com

Joshua S. Stein
Sandia National Laboratories, Albuquerque, NM
jsstein@sandia.gov

PV Performance Labs and Sandia Labs are working to promote the availability of IEC 61853 matrix measurements for commercial modules, and to develop and demonstrate methods for their use in PV system simulations. Please help us by sharing your data!

Module Matrix Measurements 2011

IEC-61853 Part 1: Irradiance and temperature performance measurements and power rating

Table 2 – I_{SC}, P_{max}, V_{oc} and V_{max} versus irradiance and temperature

Irradiance	Spectrum		Module temperature		
W·m^{-2}		15 °C	25 °C	50 °C	75 °C
1 100	AM1,5	NA			
1 000	AM1,5				
800	AM1,5				
600	AM1,5				
400	AM1,5				NA
200	AM1,5			NA	NA
100	AM1,5			NA	NA

Energy Rating 2018

IEC-61853 Part 3: Energy Rating of PV Modules

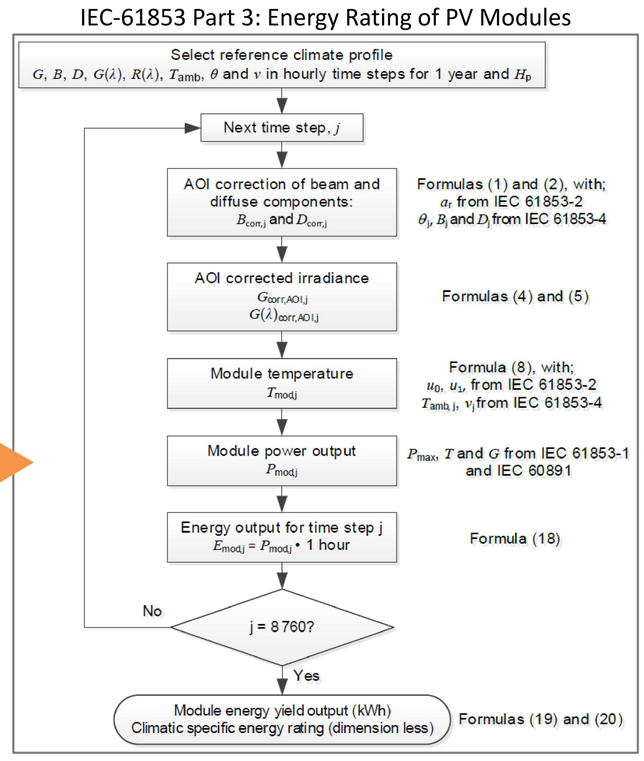
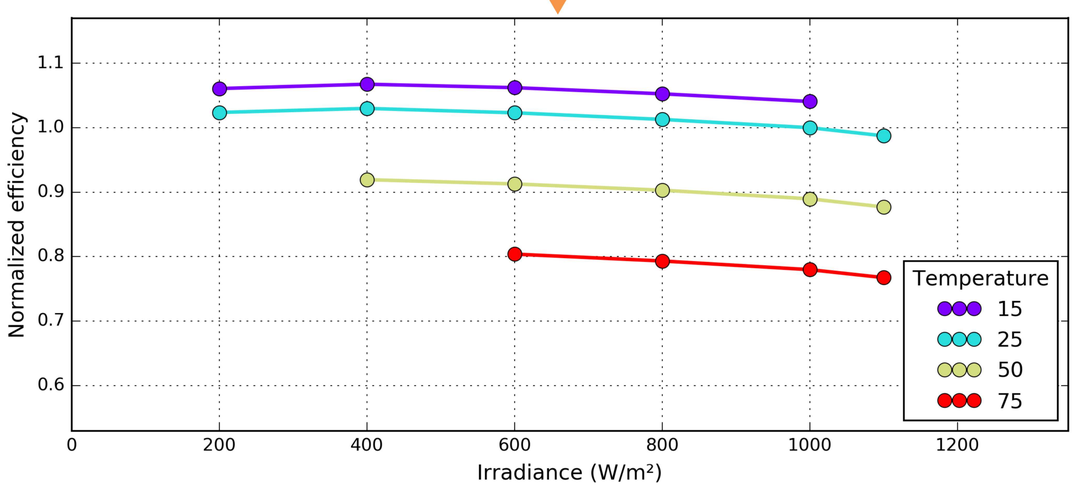


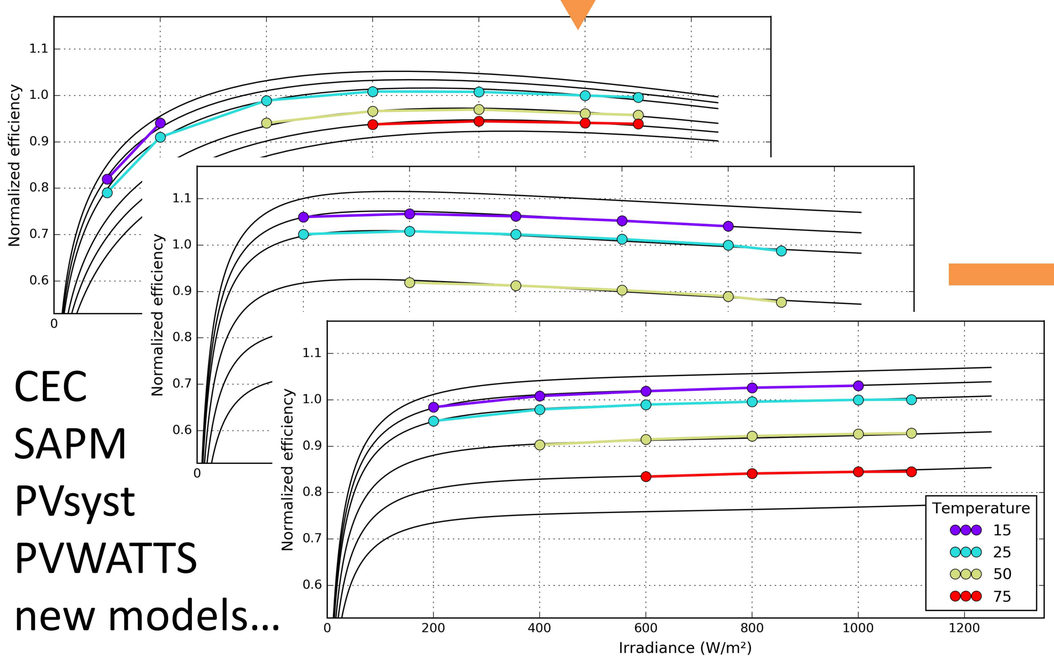
Figure 1 – Flow chart of calculation procedure



Module Datasheets ca. 2020 ?

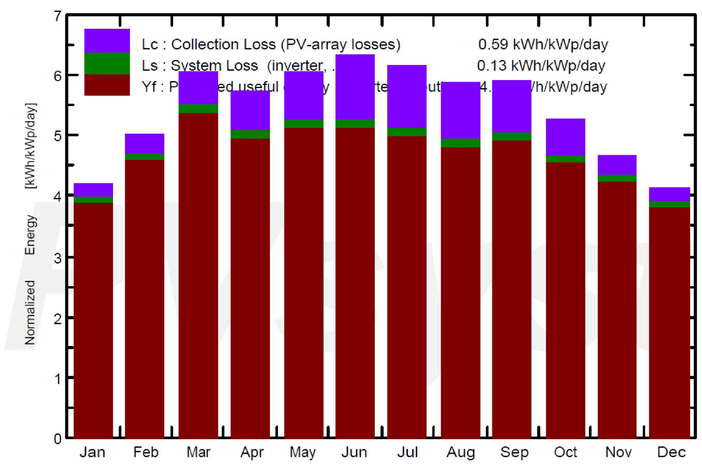
Climate profile	Climate Specific Energy Rating (CSER)
Tropical humid	78%
Subtropical arid (desert)	82%
Subtropical coastal	79%
Temperate coastal	80%
High elevation (above 3000 m)	83%
Temperate continental	82%

Accurate Performance Model Parameters



CEC
SAPM
PVsyst
PVWATTS
new models…

System Simulations with Lower Uncertainty



pvlib-python, SAM, PVsyst, PV-SOL, many others…

PV Performance Labs is multivalent company managed and operated by Anton Driesse, a wholly independent engineer and scientist based in Freiburg, Germany. PV Performance Labs specializes in measurement and analysis of components and systems, including system design, with projects in the both the research sector and industry.

PV Performance Labs Germany

Sandia National Laboratories

Sandia National Laboratories is a multimission laboratory managed and operated by National Technology & Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA0003525.