SAND2010-8091P

Welcome to the PV Performance Modeling Workshop

Sandia National Laboratories

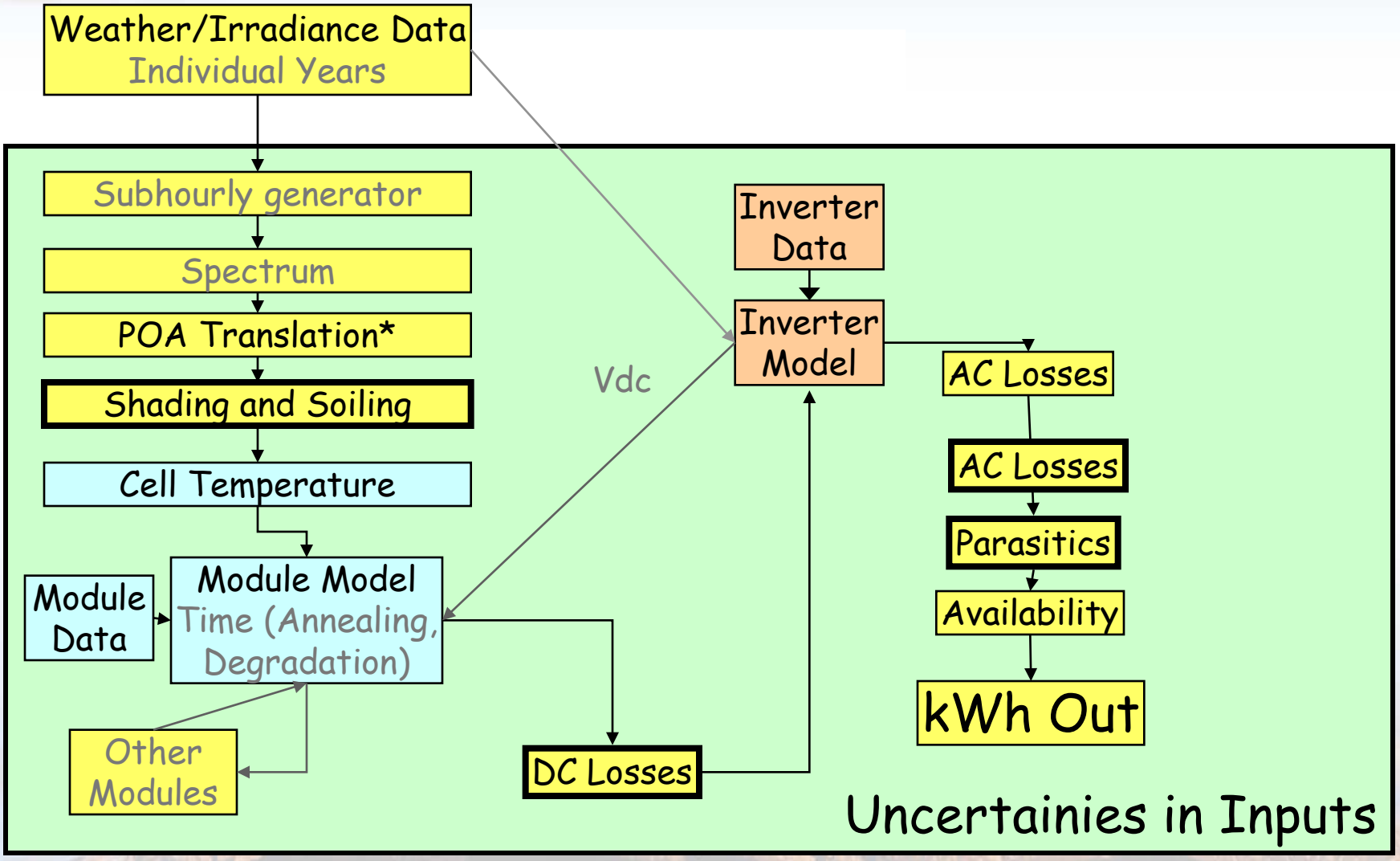
Meeting Structure

Day One

- Overview and Needs Assessment from Integrators, Manufacturers, and Independent Engineers
- Analysis of Model Accuracy
  - Results of pre-work
- Modeling the Module
  - Module models
  - Modeling module temperature
  - Discussion of needs, priorities, and paths forward

Day Two

- Beyond the module – systems modeling
  - System losses
  - Shading and MPPT
  - Large systems
  - Discussion
- Impact of uncertainty
- Discussion on ensuring quality, need for standards, model validation
- Action items and next steps
- Tours



*Gueymard has evaluated for Denver. Other evaluations for "dull" climates?

Beyond the module

Derate Factors for AC Power Rating at STC

Component Derate Factors	PVWatts Default	Range
PV module nameplate DC rating	0.95	0.80–1.05
Inverter and transformer	0.92	0.88–0.98
Mismatch	0.98	0.97–0.995
Diodes and connections	0.995	0.99–0.997
DC wiring	0.98	0.97–0.99
AC wiring	0.99	0.98–0.993
Soiling	0.95	0.30–0.995
System availability	0.98	0.00–0.995
Shading	1.00	0.00–1.00
Sun-tracking	1.00	0.95–1.00
Age	1.00	0.70–1.00
Overall DC-to-AC derate factor	0.77	0.09999–0.96001

Top Votes

11 Develop set of test to allow industry to use, standardized test procedure, not model driven

8 Non-STC operating conditions?

4 How do modules change over time, temp coefficient, performance degradation

4 What parameters need to be analyzed with statistically-significant sample size

4 Need higher confidence factors, reports to investors, accuracy, uncertainty

4 Need data sheet standard – may help understand/reduce error

4 Identical systems in different locations

3 Stress testing – risk analysis

2 Cleaning of reference cells and sensors

1 Third party verification – standard model inputs

1 How does module model impact system model @ points other than MPP (time of use value)

1 Standardize measured data from DAS

1 Models need to keep up with new technologies