SAND2011-2205C

Sandia Photovoltaics Program

- Technology Evaluation
  - Document, Evaluate and Improve Performance Algorithms
  - Test and Evaluation, Performance Coefficients
    - Techniques for flat-plate models transferred to TÜV-PTL, others
    - Emphasis on CPV, non-conventional technologies, power optimizers…
  - System Reliability Characterization, Modeling, Improvement
- Grid Integration
  - Advanced Inverter Technologies (SEGIS), MicroGrids
  - Characterization and Modeling of Impact of High-Penetration of PV on the Electrical Grid
- Market Transformation, Technical Assistance, Codes & Standards…

Sandia National Laboratories

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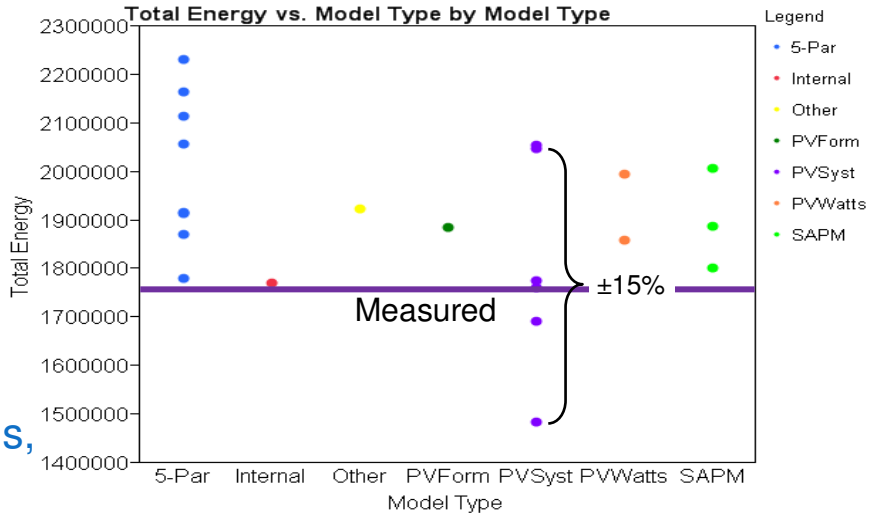
Solar Leadership Summit 2011
Presented by SolarTech

Issue: Inconsistent Results among PV Performance Models and Model Users

- At Sandia modeling workshop, model results differed among model users
  - User expertise varied
- Users have many choices
  - Irradiance models and data
  - Module models and data
  - Derate calculations or factors for soiling, mismatch…
- Uncertainty of model inputs, algorithms, and outputs are not stated



- Possible Market Impact – Are Inconsistencies and Uncertainty Important?
  - Differing performance projections may discourage buyers
  - Choices may be made guided by results that agree within error
  - Integrators oversize systems to ensure expected performance = >$'s
  - Uncertainty increases risk which can raise financing costs

- Sandia approach – collaborative, share results with model developers
  - Develop high quality datasets for model evaluation and improvement
  - Perform analysis of model algorithms used in common models
  - Analyze propagation of uncertainty and variability

Are we on the right track?

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