150 STANDARD &POOR'S

EMPOWERING INVESTORS AND MARKETS FOR 150 YEARS

Assessing the Quality of Cash Flows of a Solar Power Project

Grace Drinker
Associate
Standard & Poor's

May 20, 2010

Why Solar? Why Now?

Why solar:

- The sun provides a stable resource in the form of direct normal irradiance and global insolation
- Solar generation coincides with peak demand for power
- Concentrated solar thermal is proven on a utility scale with a successful operating history
- The modular design of an array allows solar PV to be used for both distributed generation and utility-scale power

Why now:

- Increasing government support through Renewable Portfolio Standards and the extention of the Investment Tax Credit
- Capital costs are declining due to improvements in conversion efficiency, balance of system components and design, coupled with decreasing silicon prices
- US retail electricity rates are expected to increase due to cost of carbon and, we believe, additional capital expenditures will help make PV competitive with conventional forms of generation

STANDARD &POOR'S

Bottom line: It's all about production

Solar power production is a function of something greater than the shining sun

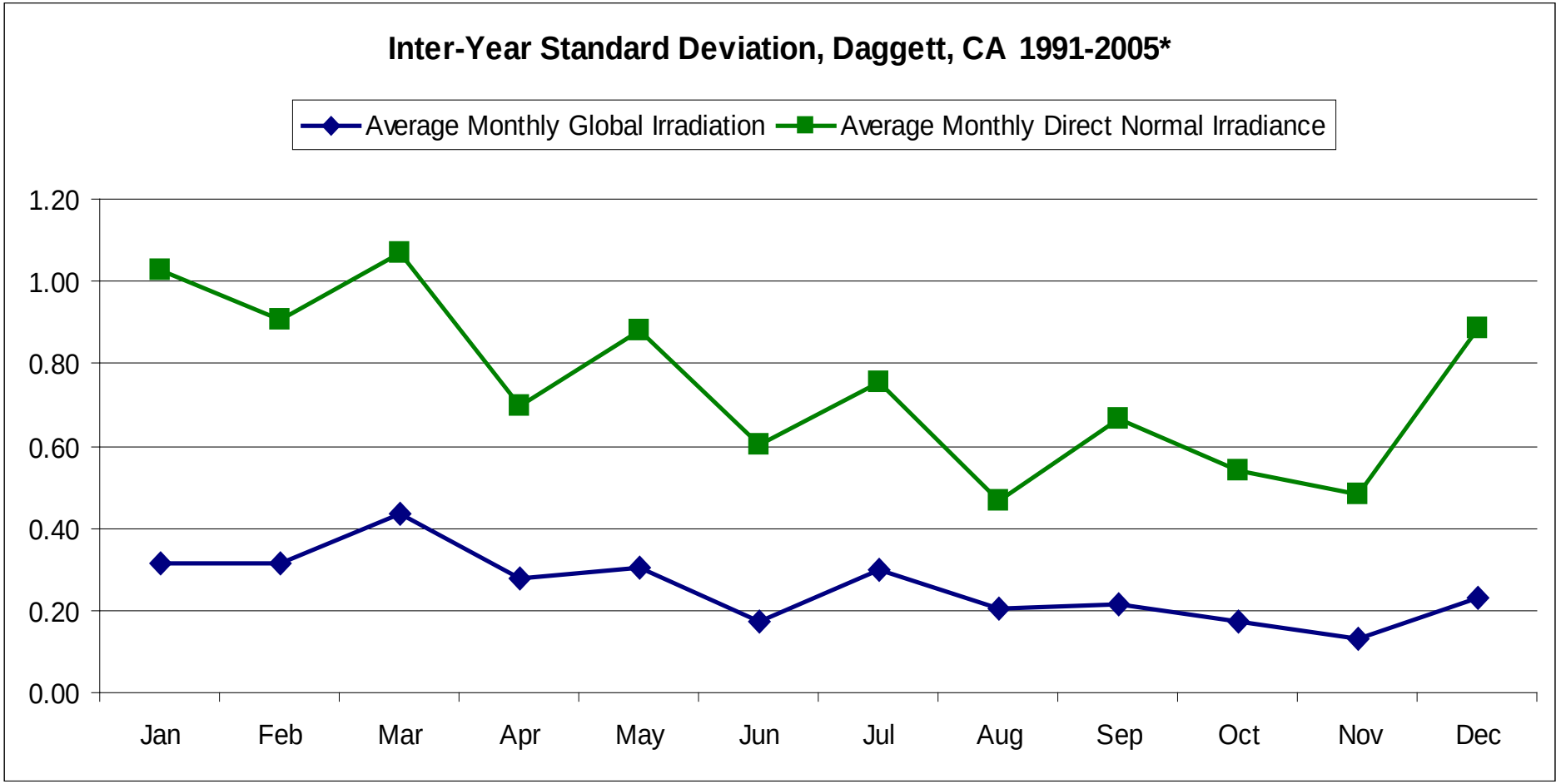
- proper engineering
- performance and reliability of components
- availability of the plant

Operating and maintaining a plant has its price

- less of an issue with solar
  - less moving parts than conventional power
  - CSP more exposed to O&M costs than PV

STANDARD &POOR'S

Solar Resource Not As Risky As Wind



*1991-2005. Source: National Solar Radiation Database

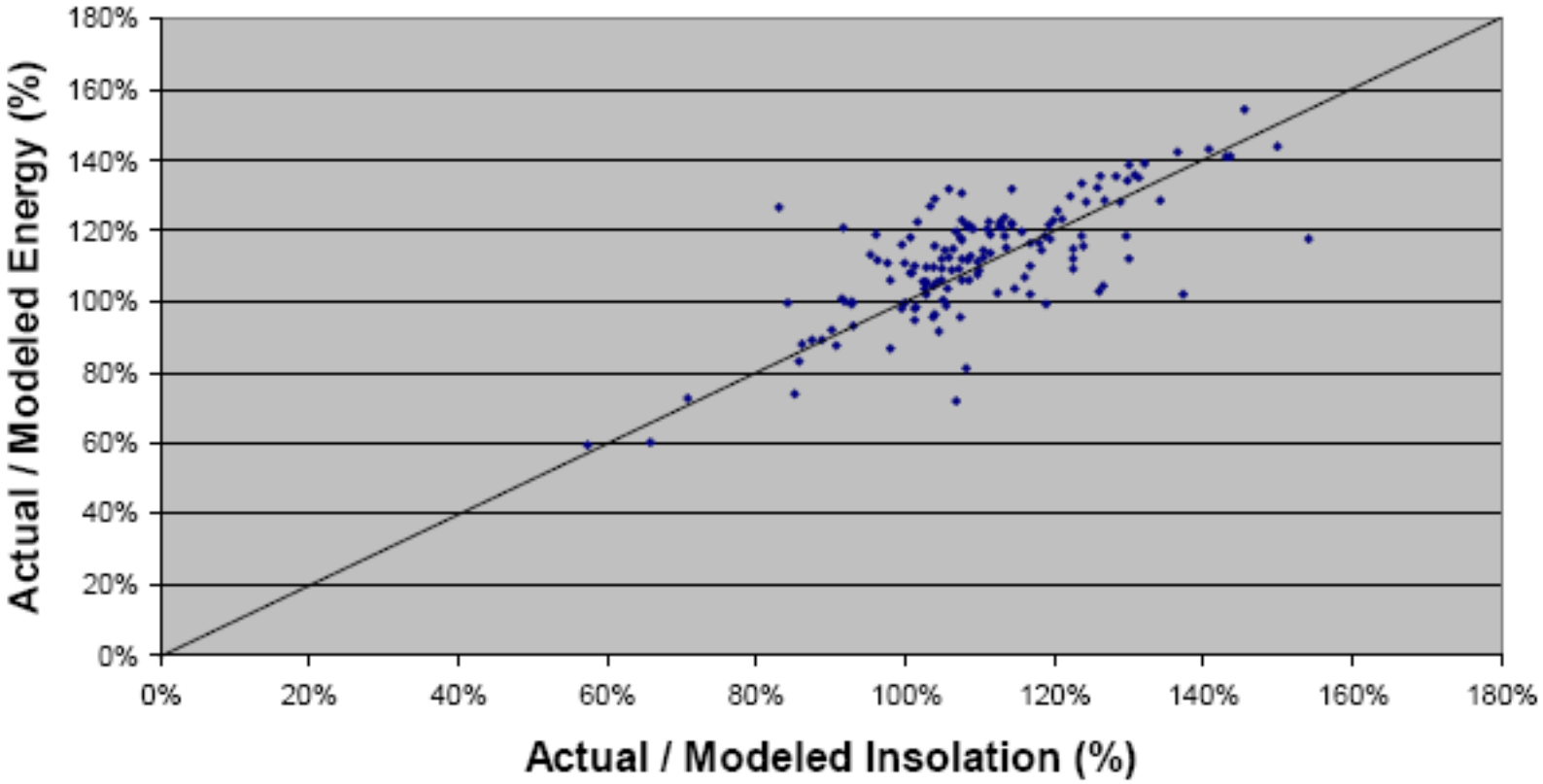
STANDARD &POOR'S

Measurement of solar resource assessment important

- **Public data is not sufficient**
- **Solar resource assessment more important for CSP projects**
  - greater variability in DNI
  - potential for Time-Of-Use Power Purchase Agreements
- **We will look to an independent engineer and/or recognized solar resource consultant to opine on the strength of the solar resource.**
  - How much measured data is on site?
  - Is there a strong correlation between measured and modeled satellite data?
  - Do the measurements take system orientation and configuration into account?

STANDARD &POOR'S

Variability In Sunlight Does Not Explain All Variability In Generation



Source: SunPower Corp

STANDARD &POOR'S

What Leads To a Decline In Production?

For PV

- **Underperforming technology**
- **Poor engineering and design of system**
  - Mismatched modules, problems with an inverter, shading
- **Poor maintenance**
- **Heat degradation**
  - The hotter the temperature, the faster the degradation
- **Inverter performance**
- **Modeling**

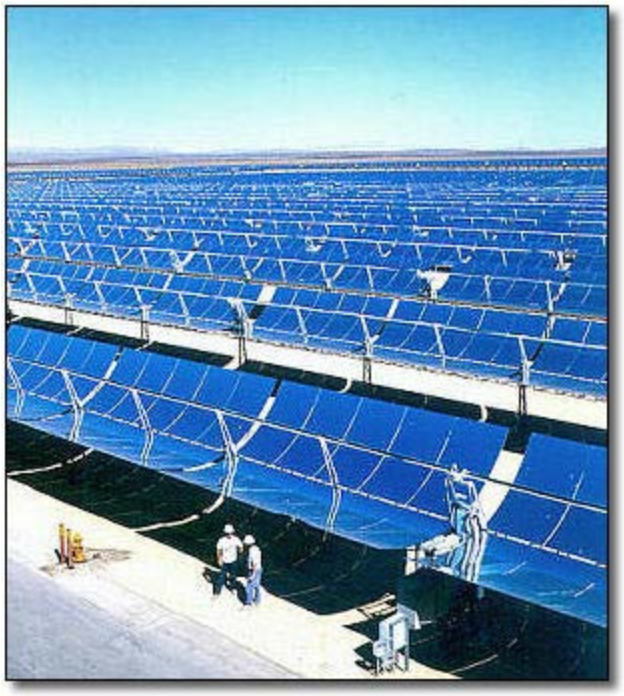
For CST

- **Underperforming technology**
- **Poor engineering and design of the system**
  - Inefficient scale-up, placement of receivers, flawed HTF flow design
- **Poor maintenance**
- **Tracking device problems**
- **Modeling**

STANDARD &POOR'S

Operating and Maintenance Costs Are Important

- **Costs expected to be higher for CSP than PV**



STANDARD &POOR'S

Experience To Date

- **Range of credit outcomes**
- **Other credit factors**
  - Construction risk, especially for CSP
  - Offtaker risk
  - Financial structure

STANDARD &POOR'S

www.standardandpoors.com