



What Demonstration of Reliability Is Needed Before Investment?

PV Module Reliability Workshop – Feb. 18-19
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SunEdison Fleet



- **SunEdison North American Fleet includes 95.9MW across 332 sites;**
- **Systems range from 30kW to 10MW;**
- **Lifetime energy production >200GWh;**
- **2009 fleet uptime was >98.5%;**
- **Predominately crystalline silicon but also includes a-Si and CdTe.**

How is a project valued?



- **All based on cash flows – no relationship to cost to build;**
- **Cash flows based on:**
 - Incentives and PPA rates;
 - Energy production (insolation, uptime, design, components);
 - OM&M costs;
- **Two module reliability metrics that most influence project valuation:**
 - Residual value – based on useful life at termination of contract;
 - Degradation rate;

Minimization of project risk



- **Energy estimates performed by third party engineers;**
- **Coverage ratios are significantly below 100%;**
- **Portfolio or fund approach provides additional risk reduction;**

- **Investors are generally covered in the event of even severe underproduction on individual systems.**

What Demonstration of Reliability Is Needed Before Investment?



- **Strong warranty backed by a strong balance sheet in the case of catastrophic failure.**

Building a bankability package



- **IEC qualification tests are the price of entry;**
- **Warranty and financial backstop (emerging alternatives);**
- **Building the story:**
 - General technology history;
 - Demonstration of fundamental understanding of the product and its application;
 - Specific manufacturer Quality Assurance programs;
 - Fielded history.