Proposed Substantive Changes to SB 1 Guidelines

DOCKET
07-SB-1
DATE SEP 29 2008
RECD. SEP 29 2008

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Renewables Committee Workshop

September 29, 2008

Proposed Administrative Changes

- **Audits to Evaluate Operational Performance of Solar Energy Systems**
- **Extend Implementation Date for Chapters 3, 4, and 5 to July 1, 2009**

SB 1 Assignments to Energy Commission

- **Establish Eligibility Criteria**
  - **Design, Installation and Electrical Output Standards or Incentives**
  - **Conditions for Ratepayer Incentives**
- **Set Rating Standards for Equipment, Components and Systems**

SB 1 Specific Expectations

- **High Quality Solar Energy Systems**
  - **Maximum Performance to Promote Highest Production per Ratepayer $**
- **Optimal System Performance During Peak Demand Periods**
- **Energy Efficiency in Home or Commercial Structure Where Solar is Installed**

Energy Efficiency for Newly Constructed Residential

- Update to 2008 Building Standards that Go Into Effect July 1, 2009
- Tier I – 15% Savings Total Energy
  - Matches California Green Building Standards
- Tier II – 30% Savings Total Energy and Cooling Energy
  - Promotes California Goal to Get to Zero Net Energy by 2020 (CEC, CPUC, ARB)
  - Need Big Bold Incentives For Builders

Energy Efficiency for Commercial Buildings

- **Newly Constructed Buildings**
  - **Tier I – 15% Savings Total Energy**
    - **Matches California Green Building Standards**
  - **Tier II – 30% Savings Total Energy**
    - **Promotes California Goal to Get to Zero Net Energy by 2030 (CEC, CPUC, ARB)**
- **Existing Commercial Buildings**
  - **Expect Benchmarking for PBI Systems**
    - **Consistent with AB 1103**

Other Solar Electric Generators

- PBI Only
- Full Safety Certification with Follow-up Service or Listing from NRTL
- NRTL may Develop New Test Protocol
- Eligible Listing Indicates Safety Testing Only

Meters

- **Inverter-Integrated ±5% Accuracy**
  - **Certification by NRTL Required Beginning January 1, 2010**
  - **Requirements per CSI Metering Subcommittee Test Plan**

Installer Verification

- **Alternate Installer Inspection Protocol**
  - **Visual Inspection**
  - **Polarity Check**
  - **Open Circuit Voltage and Short Circuit Current Measurement and Comparison**
  - **Based on NABCEP Recommendations**

Field Verification

- Required for PBI < 50 kW
- 1 of 7 Sampling Allowed
- Visual Inspection of Components, Installation Characteristics, Shading
- Encouraged for all PBI
- PA's may Waive Assessment of Future Shading if Disclosure Provided to System Owner

Hourly PV Production Calculation

- Allows CECPV Calculator or Other Calculator that Meets Guidelines
- Hourly Calculation, Detailed Equipment Models to Reward Optimal Performance During Peak
- Per String Shading Measurement Removed

Shading

- **Solar Availability**
  - **Monthly Solar Availability Option**
    - **20 Values**
    - **3 per Month for June through September to Capture Peak**
  - **Measurements at Major Corners**

Shading

- **Shade Impact Factor**
  - **Accounts for Disproportionate Effect of Partial Shading on PV Production**
  - **Default Value = 2**
  - **Technologies Demonstrating Effective Partial Shading Tolerance will be Considered for Lower Shade Impact Factor**

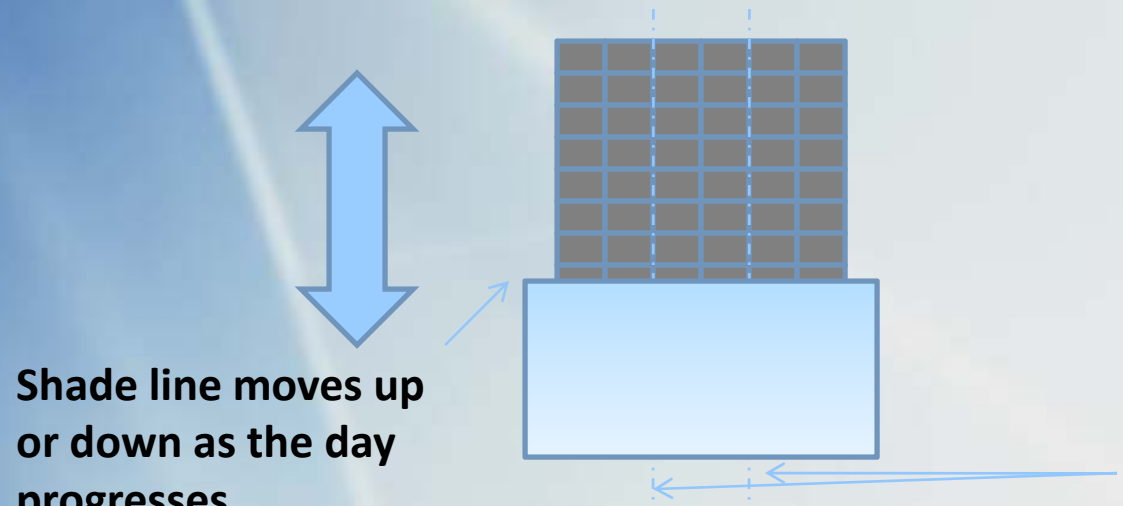
Shade Impact Factor (SIF) Considerations

Tim Townsend

BEW Engineering

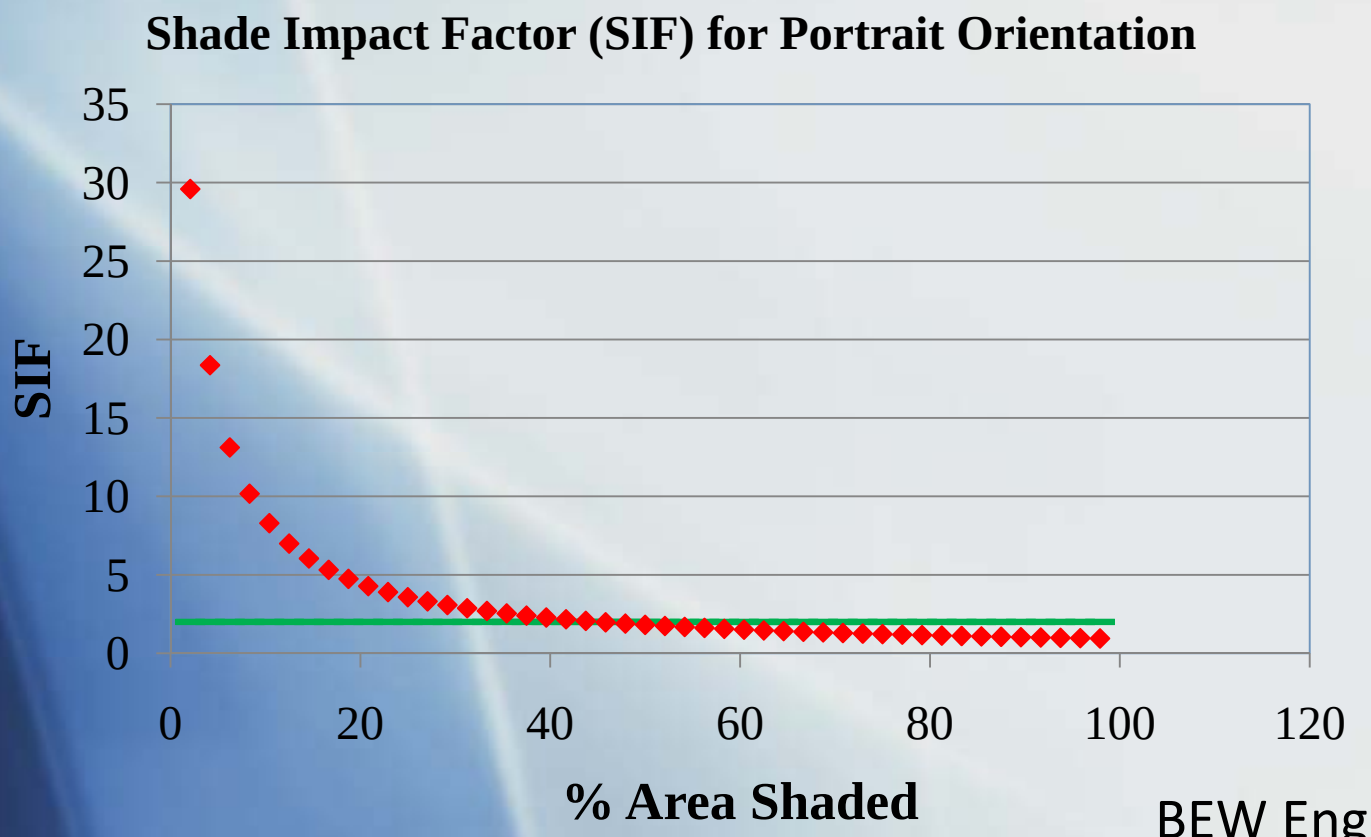
Renewables Committee Workshop

September 29, 2008



Shade line moves up or down as the day progresses

Dashed lines indicate bypass diode location



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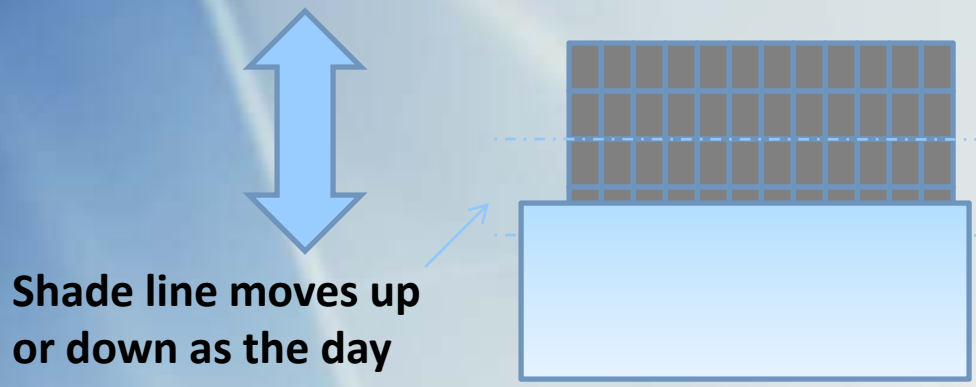

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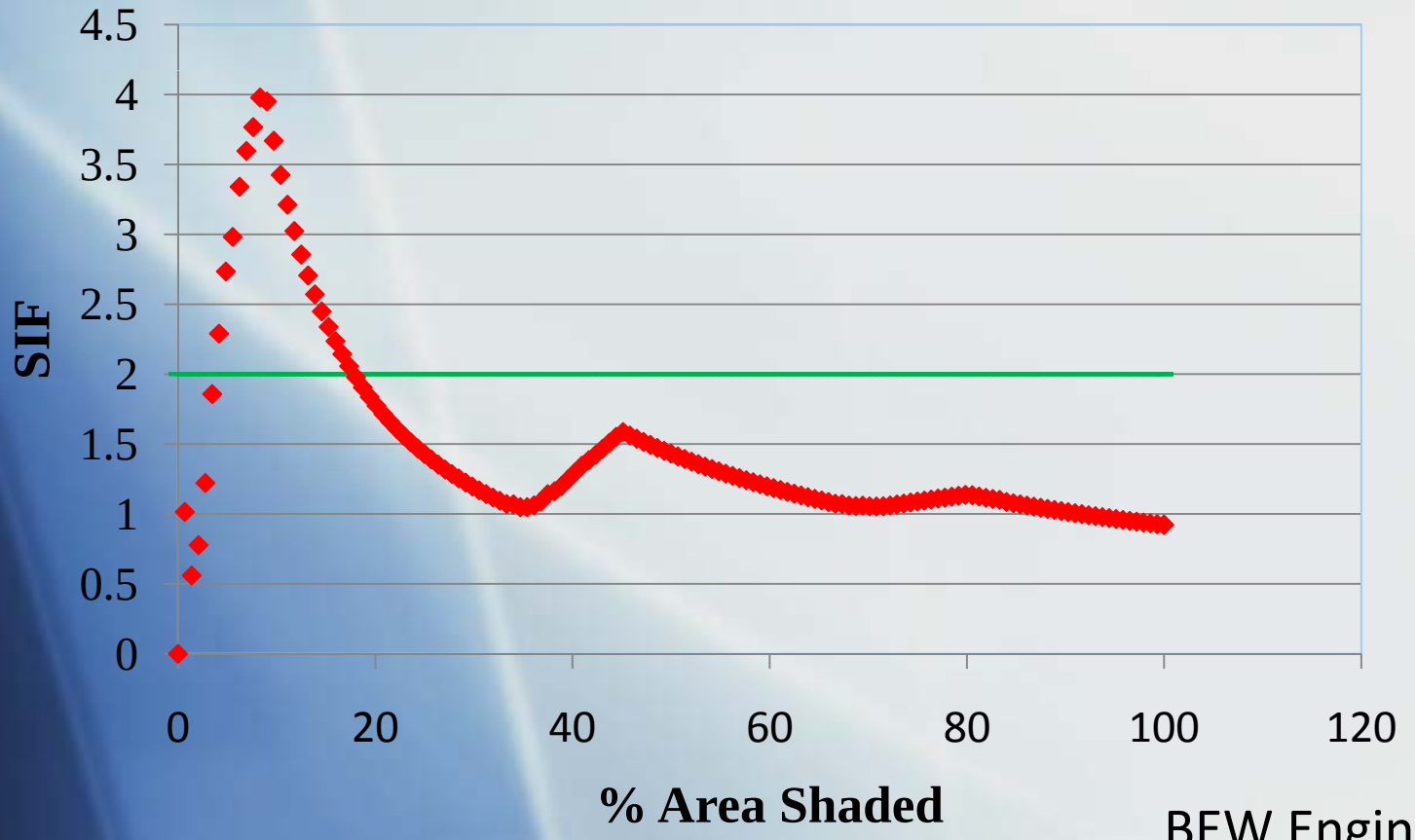
Shade Impact Factor (SIF) for Landscape Orientation



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Annual Shade Loss Results

SIF = 2.1 ≈ 2

- Simulation w/PVSYST
- Sacramento
- 30 degree tilt
- South-facing
- Portrait modules
- 30 kW
- 175 watt modules
- Row Spacing 2:1 setback

- Area-related shade loss
  - 3.2%
  - Corresponds to shade impact factor 1.0 (status quo treatment)

- Shading loss analysis
  - 6.6%
  - Assumes circuit is limited to shaded region whenever shade is 1/12th of area or more

PUBLIC COMMENTS

Next Steps

- **Oct 6: Written Comments Deadline**
- **Nov 4: Release Notice of Adoption and Proposed Final Guidelines**
- **Nov 19: Business Meeting Adoption**