SATELLITE IRRADIANCE MODEL ACCURACY IMPROVEMENTS: ACCESS TO LATEST INPUTS AND >20-YEAR VALIDATION

2020 PV Systems Symposium Webinar

June 24, 2020
Data
Reduce risk on your solar project
Get the most accurate, bankable solar resource data.

SystemCheck®
Validate PV system performance
Automatically monitor and assess performance of PV systems and fleets.

FleetView®
Effectively integrate solar into your grid
Plan for solar adoption on your distribution system with site-to-feeder-specific PV production.

Forecast
Forecast solar power
Reliably predict production from utility-scale PV with the most accurate, solar-specific forecast.
Today’s presentation

▪ Motivation
▪ Input and validation data
▪ V3.4 model performance
▪ Key results
Need for consistent and real-time solar data is increasing

- Benchmarking performance
- Solar resource tuning
- Weather trends
Why temporal consistency matters

Annual Insolation

Resource Data

Short Validation

Correlation

Tuned Resource Data

Dataset A

On-site data

Dataset B

Dataset A

On-site data

1998

2020

Correlation
Why temporal consistency matters

- Short Validation
- Complete Validation
- Dataset A
  - On-site data
  - Dataset B
  - On-site data

Annual Insolation

1998 to 2020

Resource Data

Correlation

SolarAnywhere®
Quality and volume of data enable more accurate models

- New satellites
- Numerical weather models
- 20+ years of ground measurements
- Leveraging software techniques
New satellites offer better performance

Comparison of GOES-13 and GOES-16

Half Hourly RMSE of GHI for Western Validation Stations

However, maintaining consistency is critical
Ground measurements provide an excellent long-term reference, but different biases must be considered.
Directional response present in pyranometer data
Indirectly measured GHI shows better alignment of clear sky irradiance
Today’s presentation

- Motivation
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- Key results
Long-term bias errors provide a quick view of accuracy
Annual statistics are more important for many use cases.
SolarAnywhere v3.4 shows 18% reduction in distribution of annual errors in North America...

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https://www.solaranywhere.com/validation/leadership-bankability/data-validation/
... and excellent consistency

Temporal Consistency
Satellite-region Averages of GHI Mean Bias Errors over Full Period of Record

https://www.solaranywhere.com/validation/leadership-bankability/data-validation/
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Histogram

20-year Change in GHI (%)

ΔGHI_{20-yr}

Mean: 0.6%
SD: 1.5%

Thank you

For more information, contact:
Patrick Keelin
Lead Product Manager
pkeelin@cleanpower.com

Mark Grammatico
Senior Technical Account Executive
markg@cleanpower.com

www.cleanpower.com