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pv magazine webinars

Solar Resource Data for Project Development & Financing

29 September 2020

4 pm – 5 pm | CEST, Berlin
3 pm – 4 pm | BST, London
10 am – 11 am | EDT, New York
9 am – 10 am | CDT, México

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Editor | pv magazine

Hannah Staab
Natural Power

Adam Atkins
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Solar Resource Data Considerations for Project Development & Financing

Clean Power Research®

Today's Speakers

Clean Power Research & Guest: Natural Power

Adam Atkins
Business Development Manager
Clean Power Research

Hannah Staab
Principal Advisor – Europe

Clean Power Research: Leadership & Impact in the Solar Industry

Solar Industry Focus

- 20+ years of solar industry leadership
- Proven solar data methodology & validation
- Data & services widely accepted

Software

SolarAnywhere® family of products includes:

- Data (TGY & Sites)
- SystemCheck®
- Forecast

Experienced Team

- Research & development led by experienced solar scientists
  - Dr. Tom Hoff, PhD
  - Dr. Richard Perez, PhD (SUNY-Albany)
  - Dr. Marc Perez, PhD
- >60 employees; 30+ researchers, software engineers, & SMEs

Solar Industry Impact

- 8GW of financed and interconnected solar in 2019
- Monitoring over 1 million operational solar systems

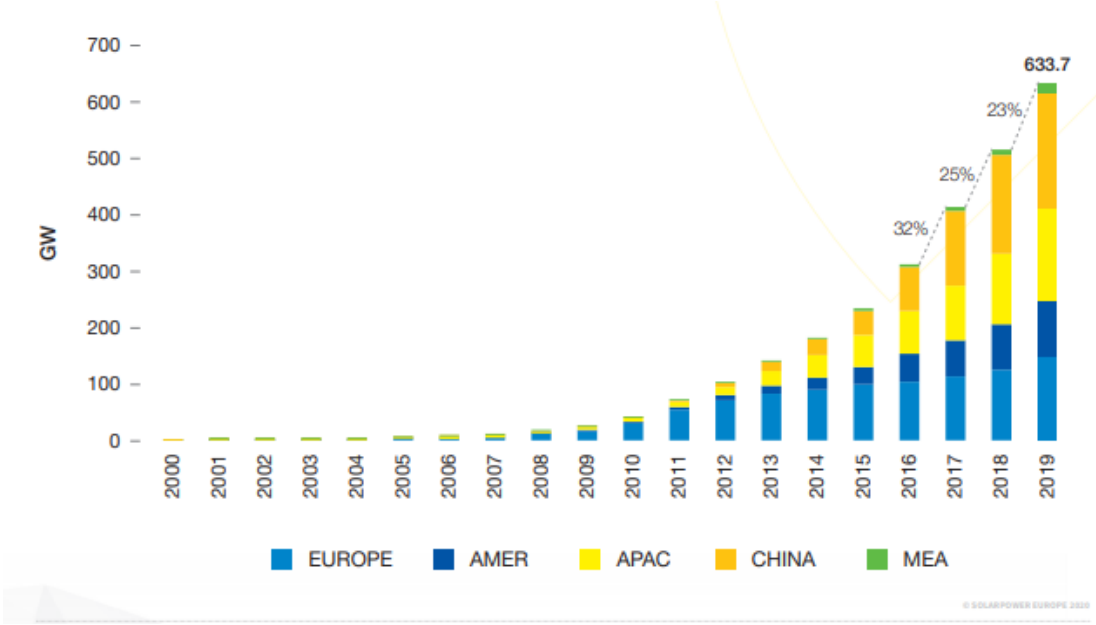
SolarAnywhere®

Quality Solar Data: A Critical Component of Success

Satellite-based irradiance data has been a significant driver of the solar industry

- Reduced resource assessment costs and time
  - Less dependence on ground-based irradiance measurements
  - Multiple decades of data to understand interannual variability
- Rapidly increased project development cycles and reduced risk for investors
- Solar industry growth, at scale, across the globe

Total Solar PV Installed Capacity 2000-2019



Source: Global Market Outlook For Solar Power / 2020 - 2024, p. 20, Solar Power Europe

Choosing Solar Data Wisely

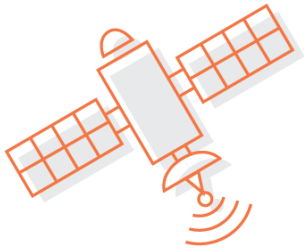
Solar assessment considerations for project development

- Prospecting: Understanding and trusting solar resource accuracy, uncertainty and risk
  - Ground vs. satellite measurements?
  - Interannual variability

- Mid-stage: Making informed and expedient decisions
  - Opportunities in unexplored regions
  - Comparing projects across a large portfolio

- Financing: Avoiding surprises
  - Sudden changes to resource and energy assessment during due diligence
  - Irradiance shopping

Reducing Performance Risk: Attributes of Bankability



Validated & Well Understood Uncertainty

Consistent

Accepted and Trusted

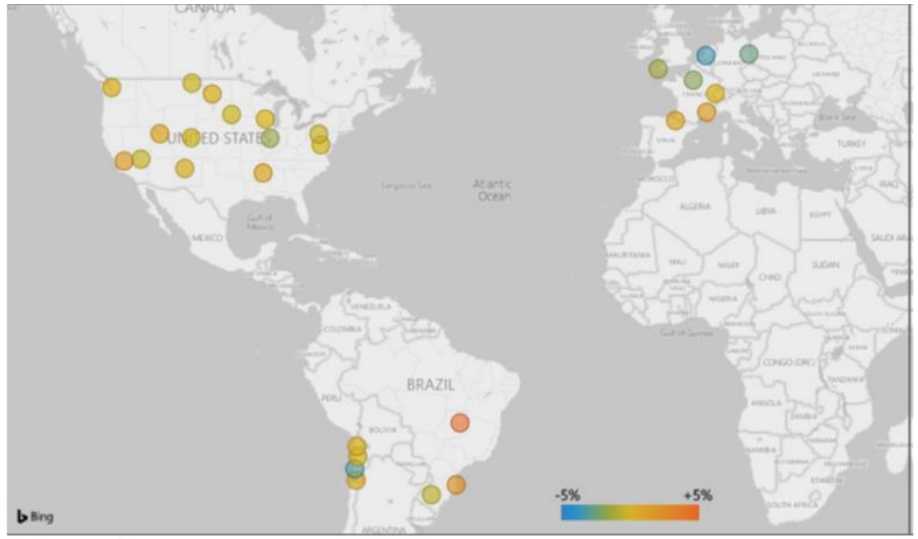
Comprehensive and Accessible

Validated for Accuracy

Understanding the statistics requires additional scrutiny

- Validation statistics are trustworthy if they're easily duplicated
- Validation statistics are meaningful when reliable ground station data is used
- Validation over many continuous years prevents "cherry picking"
- Test new datasets against existing ground and satellite-based irradiance datasets to compare and ask questions

SolarAnywhere® Validation

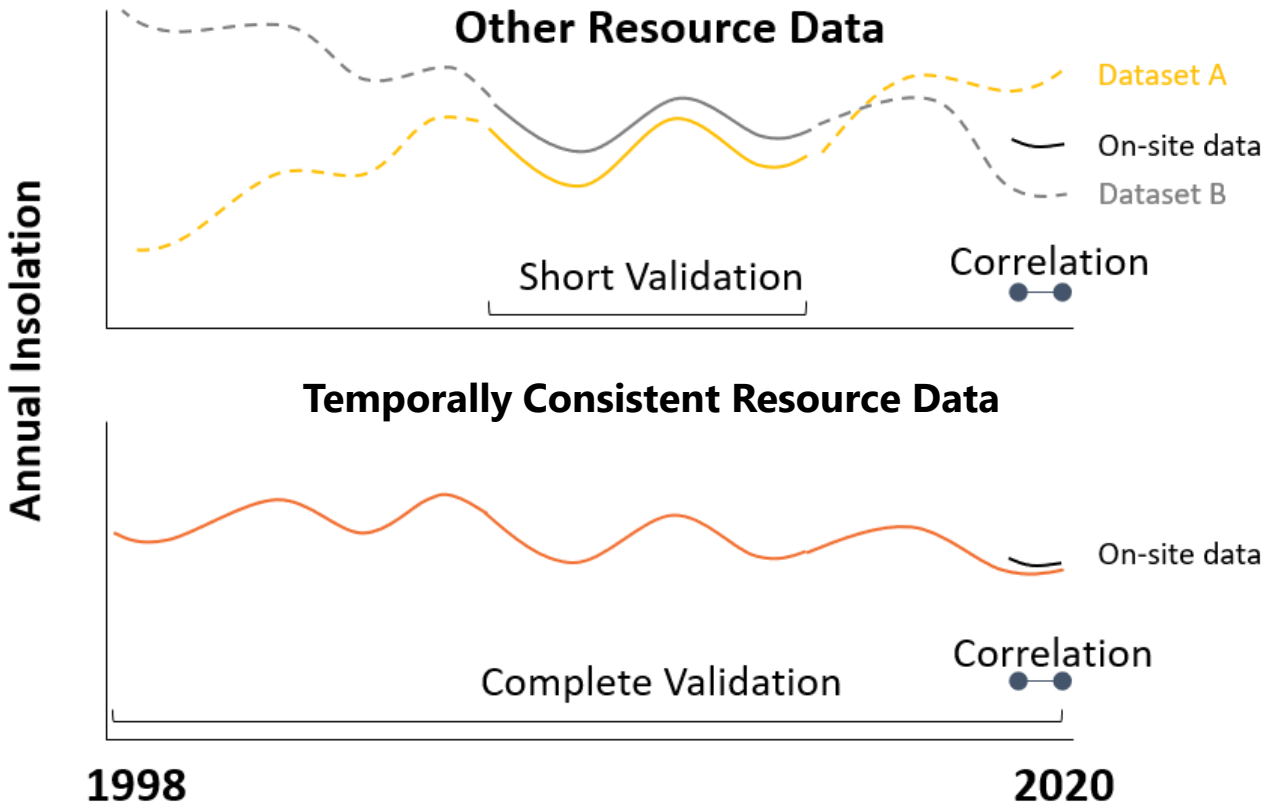


	Annual			
	rMBE	Standard Dev.	95% C. I.	Ref. Years
North America	+0.1%	1.6%	[-3.1%, +3.3%]	207
South America	+0.6%	2.2%	[-3.6%, +4.9%]	48
Europe	-0.8%	2.2%	[-5.0%, +3.4%]	107
All	-0.1%	1.9%	[-3.9%, +3.7%]	362

Temporally Consistent

Accuracy of the long-term mean irradiance is crucial

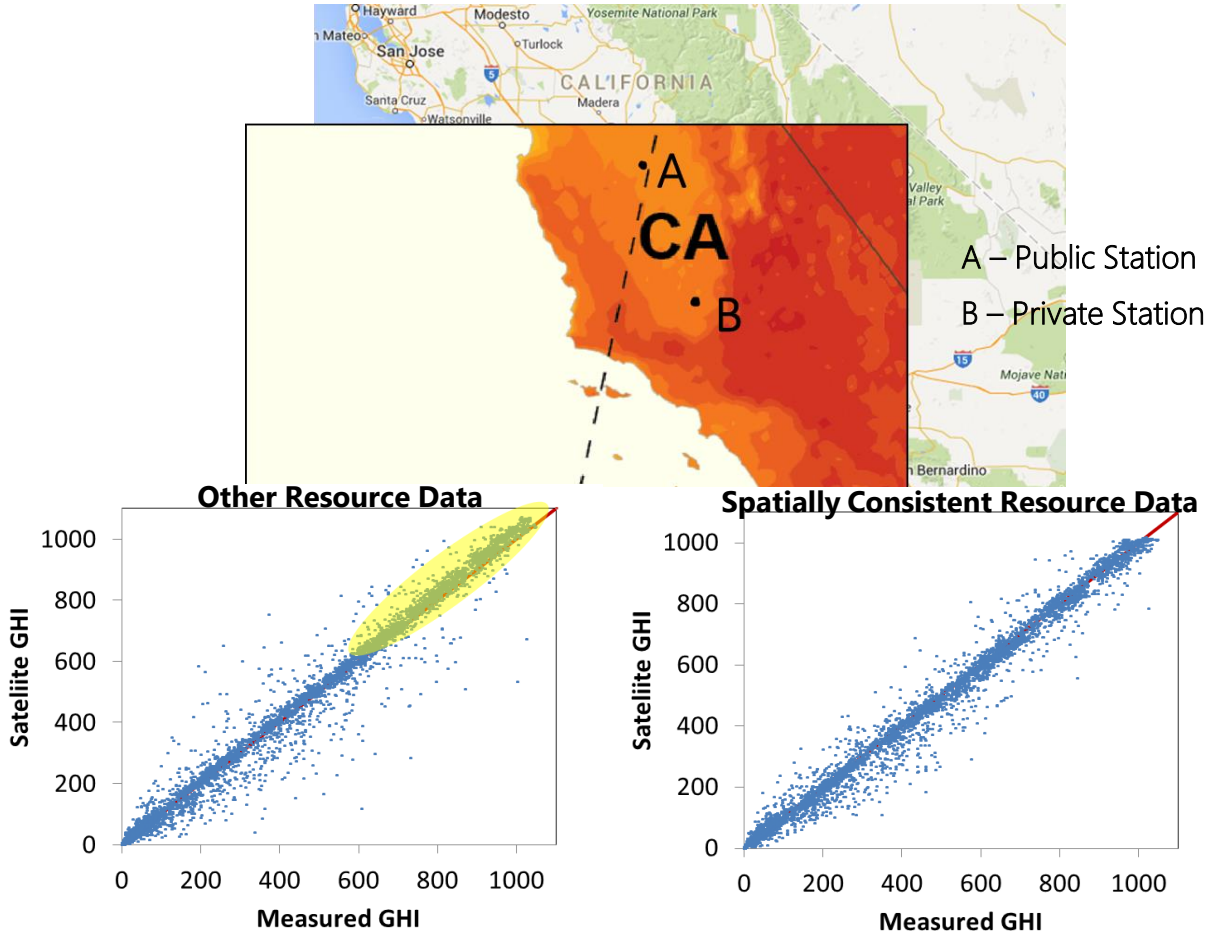
- Cherry picking hides potential model inconsistencies, leading to biases and inaccurate project value calculations
- Validation with ground measurements of 10-20 continuous years is key for accurate long-term energy forecasts
- A temporally consistent dataset improves accuracy of P50 and P90 estimates



Geographically Consistent

Is the dataset spatially consistent?

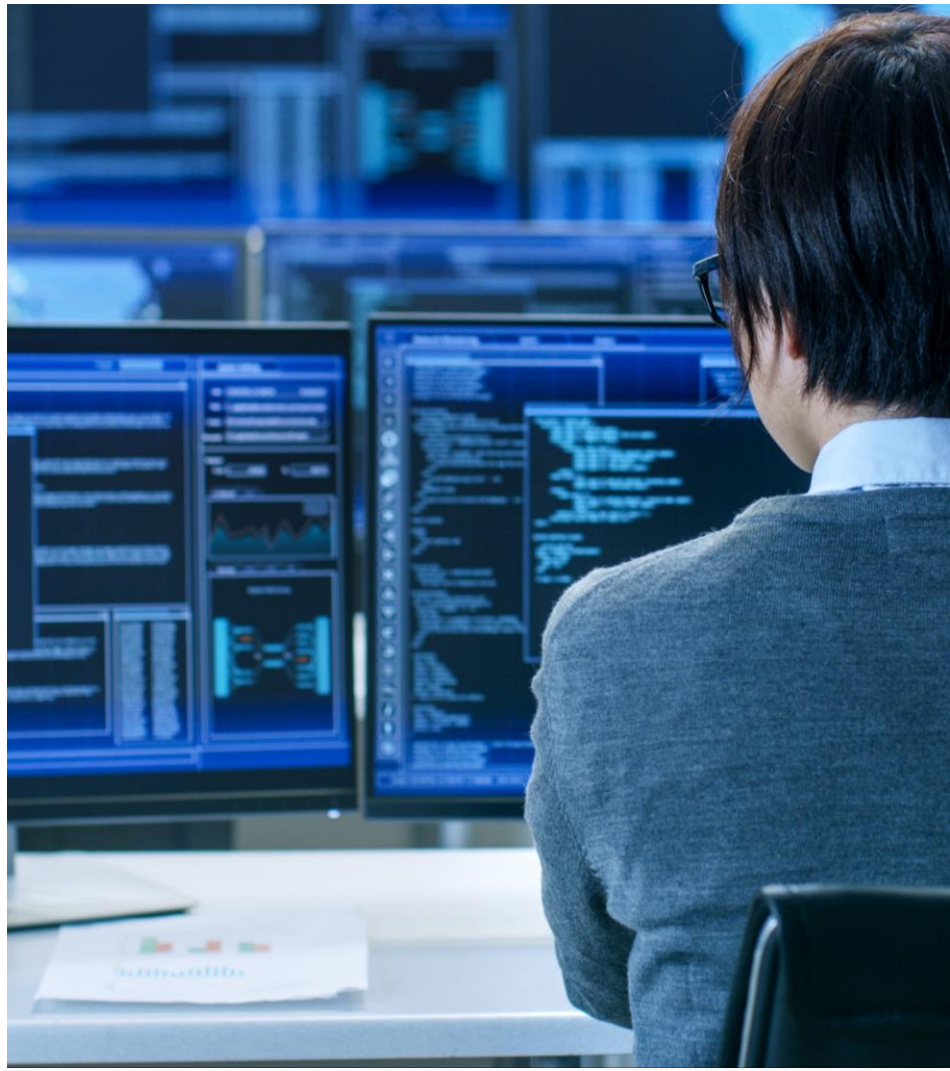
- Satellite model must be spatially consistent to avoid "unknown uncertainty"
- Satellite-based irradiance models shouldn't rely on ground-based data for regional tuning
- Enables fast comparison of projects across a broad portfolio
- Reduced time and cost of development in new regions



Comprehensive and Accessible

Will the dataset and tools help you stay competitive?

- Weather variability emphasizes the importance of incorporating recent data
- Competitive tenders and RFPs require rapid responses without waiting on slow solar data delivery
- Companies are becoming more distributed and require workflow collaboration
- Comprehensive data needed to model solar, solar+storage, or hybrid projects



SolarAnywhere Helps Project Stakeholders Make Better Decisions

Accurate

- Validated with pyranometer data from the highest quality, well maintained, and public stations
  - >360 site years
  - 10-20+ continuous years
- +/-3-4% MBE at 95% confidence interval

Accepted & Trusted

- Used and accepted by leading global developers, independent engineers and investors
- Versioned datasets – to meet project timelines and due diligence requirements
- Exclusive partnership with Dr. Richard Perez, founder of global satellite-to-irradiance model

Consistent & Precise

- Temporally and spatially consistent
- Built on self-calibrating model that doesn't need regional ground tuning

Comprehensive & Accessible

- Self-service, web accessible data 24/7
- Data for a complete solar resource assessment
  - 1998 – current
  - Typical Year, Time Series, P-values
- Available on-demand, in under 5 minutes
- >99.9% uptime for over 1,000 users

Natural Power

Success in European Solar Advisory

- Independent renewable energy consultancy, with over 25 years' experience in providing services across the project lifecycle
- Solar PV activity - feasibility assessments, permitting, design and construction to project finance and M&A due diligence
- Over 8 GW of solar due diligence mandates and over 6 GW of solar energy yield assessments worldwide
- Recent European work includes advising on competitive auction strategy in Ireland, performing due diligence on subsidy-free UK and Iberian assets, and acting as Owner's Engineer in France

Discussion

Q&A Session & Dialogue between the Editor, Natural Power, Clean Power Research

Thank You

Clean Power Research®