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Based on real-time all sky images for intrahour solar forecasting needs



ABOUT

SteadyEye provides advanced solar irradiance and production forecasts up to 30 minutes ahead. This unique nowcasting product combines on-site sky imagery processing with weather forecast, physical models and artificial intelligence. The product is designed to anticipate solar power ramp events and to guarantee PV production.

Sky and weather conditions above solar power plants are continuously monitored using SW-X all sky imager(s) and predicted locally, improving the accuracy of solar forecasts for the next minutes and anticipating the risks of variability.

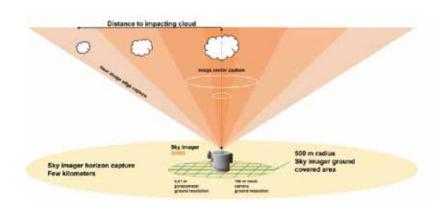
KEY BENEFITS

- OPTIMIZE PV POWER RAMP MANAGEMENT
 Thanks to 1 minute forecast update frequency
- REDUCE HYBRID PLANT OPERATION COSTS
 By increasing the use of solar energy
- FACILITATE BALANCING OF POWER GRIDS
 And manage spinning reserves
- IMPROVE OFF-GRID ENERGY SYSTEM OPERATION
 By fostering balancing of the system

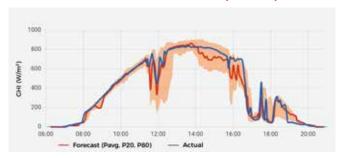
SOLUTIONS

- · Hybrid systems & storage
- Off-grid microgrids
- · Plant operations
- · Grid management
- · Insular system management

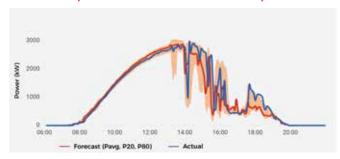
SKY IMAGER COVERAGE



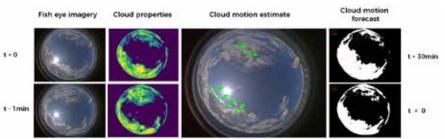
Intrahour GHI forecast for 1 site (France)



Intrahour power forecast for a 3.2MWp PV-Diesel plant (Australia)



Sky imager-based cloud forecast above one site in France



FEATURES

30 min

Max time horizon

Every 1 min

Update frequency

1 min

Forecast time-step

Power, GHI, DNI, DHI, GTI, **Temperature**

Available parameters

Site, Portfolio

Coverage

PV, Trackers, Bifacial, CSP Technology

API, SFTP or Modbus

Data delivery

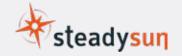
P10, P20, ..., P80, P90 Confidence levels

METHODOLOGY



- sky imager(s)
- > Visible images and atmospheric measurements
- > Every 30 seconds
- > From Steadysun SW-X series > Cloud detection, classification and motion prediction
 - > Accurate estimation of clear sky conditions using real-time aerosols prediction
 - > Calculation of direct and diffuse irradiance components in cloudy conditions
 - > PV modeling based on physical models and plant features
 - > Probabilistic forecasting using physical and statistical approaches

- > Based on historical and/or realtime on-site measurements
- > Continuous accuracy improvements using state-of-theart machine learning techniques
- > Flexible sending (API, SFTP, MODBUS, etc.)
- > Customized format (csv, txt, etc.)
- > Dedicated and secured Steadysun's web interfaces (visualization, data analytics and warnings)
- > Forecast performance monitoring







> To take into account local weather phenomena and power plants' behavior