



# Smart Renewables

## OPERA for Solar

OPERA for Solar is a cloud-based, IoT-powered intelligent platform which drives optimal plant performance for operators, asset managers, and owners under complex grid and high-end energy forecasting requirements. While delivering an efficient real-time data analytics and decision support system, OPERA offers multiple interfaces to engage with plant operations and ensures all stakeholders maintain real-time transparency.



## Challenges

- Increasing OPEX due to lack of predictive maintenance
- Tracking solar panel degradation and predicting key equipment failures
- Inaccurate energy forecasting and subsequent penalties over Utilization Index
- High cost of facility surveillance and security personnel
- Unwarranted shutdown or delayed maintenance of plant equipment due to false data injection and spoofing
- Photo Voltaic Plant process data quality and unavailability issues



## Solutions

- Instrumentation of all the assets in the solar plant like solar panels, modules, strings, inverters, transformers and connecting through SCADA system to the cloud via gateway
- Edge analytics implemented at the gateway to cleanse data and also provide alerts
- Business intelligence analytics, performance analytics, case analysis, plant monitoring and control, all in a single platform
- Billing and revenue invoicing & connectivity with ERP system
- Intelligent energy forecasting with short-term and long-term visibility to maintain maximum power output and avoid penalties
- Predictive maintenance of the assets using big data analytics provide alerts for planned maintenance
- Algorithms to identify the efficiency issues in the system quickly improve capacity utilization factor
- Vegetation and dust level identification on PV module using pattern recognition technique on data and image
- High-end diagnosis of object intrusion and subsequent alarms



## Benefits

- Improves solar plant capacity utilization factor by 10%-30% (based on technology and location) by fine-tuning the plant operating parameters
- Improves forecasting of energy generated from solar irradiation from 60-65% (existing) accuracy level to 80-85% and helps plant owners with accurate power scheduling and to avoid penalties
- Up to 20% cost reduction in maintenance costs
- Provides higher operational efficiency
- Enables loss estimation
- Portfolio-based real-time monitoring of critical assets with performance specific KPIs

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