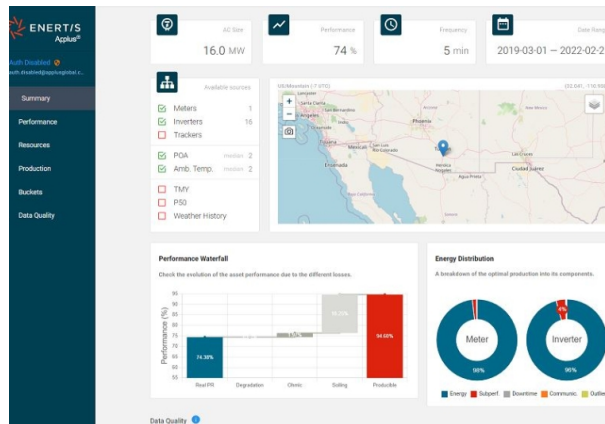


PV Performance | A-PAA

The performance of a grid-connected PV can be analyzed and enhanced with a combination of advanced data science tools and machine learning models that allow data processing at any component hierarchical level and at very small intervals, enabling analysts to obtain more information from the data recorded from the SCADA systems of solar PV plants.

The Enertis Applus+ Advanced Performance Analytics Application (A-PAA) has been developed to support our consultants' analysis to detect underperformance, carrying out a more detailed and faster analysis of the long-term performance of grid-connected PV plants, with the ultimate goal of protecting the present and future value of these assets.



THE Applus+ SOLUTION

A-PAA provides unique insight using Machine Learning and Data Science techniques, supporting our consultants' analysis with:

- **An analysis of the production evolution per component**, compared with the different resources available;
- **A calculation of how much energy has been lost during downtime events** at the meter level all the way up to the string level;
- **A calculation of a site-specific daily soiling rate and realistic soiling losses** based on the production data of the asset;
- **The detection of tracker failures and estimation of their impact** on asset production;



- **An analysis to determine losses** due to different causes, such as long-term system degradation, and utility-enforced curtailment, and to calculate actual Ohmic losses between the inverter and point-of-interconnection.

As with other AI tools, the results provided by our A-PAA PV performance tool can be used to help fine-tune forward-looking P50 expectations, as well as to inform project owners and asset managers of the most likely culprits of the sub-performance.

This photovoltaic performance tool is also able to process any type of information, regardless of the data format, therefore, if a portfolio has multiple PV plants with different SCADA systems, they can all be integrated into one single platform, thus centralizing the information, and allowing for a direct comparison of the performance across the assets.

Target customers

A-PAA helps analysts to obtain relevant information for assets and PV modules performance analysis, therefore it has been designed to be used on PV plants that are in the operations stage.

Key customer benefits

- A-PAA allows for a more detailed and faster analysis of the long-term performance of PV assets and grid-connected PV
- A-PAA allows for a direct comparison of the performance across assets belonging to a PV portfolio
- Interactive visualizations that can show performance from a high-level annual view down to the highest granularity available.
- Identification of faulty devices, such as, trackers, inverters, etc.
- Calculation of the specific long-term degradation, daily soiling rate, and Ohmic losses.