

Performance Analytics for Operating Solar Photovoltaic Facilities

Solar's Hidden Problem

kWh Analytics found that large-scale solar power plants underperformed their initial energy production expectations by 6.3% in 2020. Production uncertainty makes solar assets appear riskier to investors, resulting in higher costs of capital, a major hidden "soft cost" slowing solar deployment.

The PRISM Solution

PRISM[®] creates a **digital twin** of the solar facility to benchmark performance while accounting for actual weather conditions on site. PRISM applies advanced analytics to standard monitoring data to quantify losses from various operational issues, such as inverter and DC zone outages, snow and soiling losses, curtailment, and model error. PRISM delivers **insight** into solar facility performance and **actionable recommendations** to maximize production and revenue.

PRISM Value Proposition

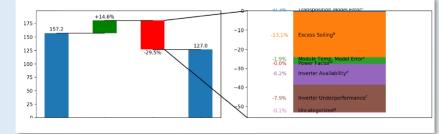
Maximize asset revenue by identifying addressable issues and reducing O&M troubleshooting effort

Assess operating fleet performance to inform accurate project valuations for refinancing and acquisitions

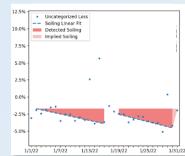
Reduce performance risk on new projects by improving production modeling and revenue forecast accuracy

PRISM Features

Detailed Performance Breakdowns



Snow & Soiling Detection DC



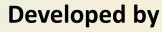
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|-----|--------|--------|--------|--------|------|---|
|     | 100    | мазау  | 194    | overan |      |   |
| 1   | -23.76 | -24.0% |        | 34.6%  |      |   |
| 2   | -5.6%  | -8.8%  | -11.3% | -8.9%  |      |   |
| 3   | 1815   | 30.1%  | 10.7%  | 10.3%  |      |   |
| 4   | -4.6%  | 3.2%   | -4.4%  | -3.4%  |      |   |
| ್ಯ  | -25.2% | 22.7%  | 34.2%  | 43.0%  |      |   |
| . 6 | 1545   | 11.0%  | 18.2%  | 11.7%  |      |   |
| 7   | -5.3%  | -3.6%  | -3.9%  | -3.7%  |      |   |
|     | -5.4%  | 4.2%   | -4.4%  | 4.5%   |      |   |
|     | 25.25  | 23.2%  | -0.0%  | 1849   |      |   |
| 10  | 5.0%   | -3.0N  | -4.6%  | -3.2%  |      |   |
|     |        |        | -      |        |      |   |

# **PRISM Cloud Platform**

- Retrieve and run performance reports
- Analyze fleet-wide performance metrics
- Access output data products via API

| Fleet Dashbo                     | pard             |                      |                                       |                    |                                     |                    | t ♣ ⊥Sign 0        | ut |          |              |              |
|----------------------------------|------------------|----------------------|---------------------------------------|--------------------|-------------------------------------|--------------------|--------------------|----|----------|--------------|--------------|
| Search                           |                  | Q Show/H             | ide Columns                           |                    |                                     |                    |                    |    |          |              |              |
| * Name                           | DC Capacity (MW) | AC Capacity (MW)     | Most Recent Report                    | Most Recent        | Performance Delta                   | Vear-To-Date I     | Performance Deita  | ^  |          |              |              |
| 84                               | 26.499           | 20.000               | 0/20/22                               | -60,1% 2           |                                     | -47.3%4            |                    |    |          |              |              |
| <u>A4</u>                        | 6.954            | 4.970                | 8/2022                                | -88.0% 1           |                                     | (18.5%1            |                    |    |          |              |              |
| Bi                               | 24.931           | 26.760               | 8/2022                                | -16.8% [           |                                     | (15.0%)            |                    |    |          |              |              |
| Ba                               | 5.229            | 3.500 PRISM          |                                       |                    |                                     |                    |                    |    |          |              |              |
| B                                | 62.114           | 53.040 # technologia | Data Query                            |                    |                                     |                    |                    |    |          |              |              |
| в                                | 5.815            | 4.450                | Facility                              |                    | State                               |                    | Start Date         |    | End Date |              |              |
| 9                                | 1.567            | 1.075 Math Galley    | Select Pacifiles                      |                    | Select States                       |                    | 1/1/2022           | 12 | 8/31/20  |              |              |
| the                              | 33.259           | 26.656               | Racking Type<br>Select a Recking Type |                    | Module Type<br>Select a Module Type |                    | Module Manufacture |    |          | Inverter Mar | nufacturer   |
| ER .                             | 200.153          | 176.00               |                                       |                    |                                     |                    |                    |    |          |              |              |
| La Constantino                   | 28.188           | 22.400               | Fun Data Query                        |                    |                                     |                    |                    |    |          |              |              |
| u i                              | 4.415            | 3.150                |                                       |                    |                                     |                    |                    |    |          |              |              |
| Q                                | 0.667            | 0.497                | Results                               |                    |                                     |                    |                    |    |          |              |              |
| Qt                               | 8.943            | 5.602                | Selection Criteria                    |                    |                                     | Loss Type          |                    |    | Tota     | i(MWh)       | % Difference |
|                                  |                  |                      | Facilities At                         |                    |                                     |                    |                    |    |          |              |              |
| Download Last<br>Month's Reports |                  |                      | 14<br>12                              |                    |                                     | Wind Stow          |                    |    | -311     | 11           | 0.0 % 4      |
|                                  |                  |                      |                                       | ov More<br>(2022   |                                     | Transposition M    | odel               |    | -3,7     | 14.5         | -0.4 % 2     |
|                                  |                  |                      | End Date 8/3                          | 1/2022             |                                     | Excess Solling     |                    |    | -7,9     | 79.9         | -0.8 % 4     |
|                                  |                  |                      |                                       |                    |                                     | Module Tempera     | ature              |    | -1,1     | 34.1         | -0.1 % 4     |
|                                  |                  |                      |                                       | 8.9% 🖡             |                                     | Power Factor       |                    |    | -4,3     | 17.7         | -0.4% 1      |
|                                  |                  |                      | Perfor                                | mance Delta        |                                     | Inverter Availabil | ity                |    | -119     | (718.0       | -12.0 % 4    |
|                                  |                  |                      | 1 000                                 | .934.6 MM          |                                     | Inverter Underpe   | rformance          |    | -21/     | 488.7        | -21%4        |
|                                  |                  |                      |                                       | er-Adjusted Energy | ,                                   | Curtailment        |                    |    | -22)     | 611.5        | -23%4        |
|                                  |                  |                      |                                       |                    |                                     | Uncategorized      |                    |    | -6,1     | 12.7         | -0.8 % 4     |
|                                  |                  |                      | 811,3                                 | 329.7 MWh          |                                     |                    |                    |    |          |              |              |





#### Visit www.sunrise-tech-llc.com/prism