



PlantPredict

PVPMC 2023



WHAT IS PLANTPREDICT?



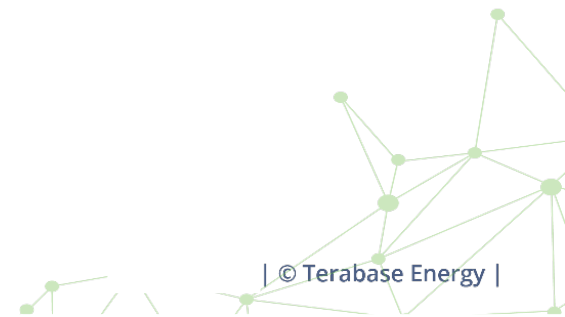
NEW FEATURES



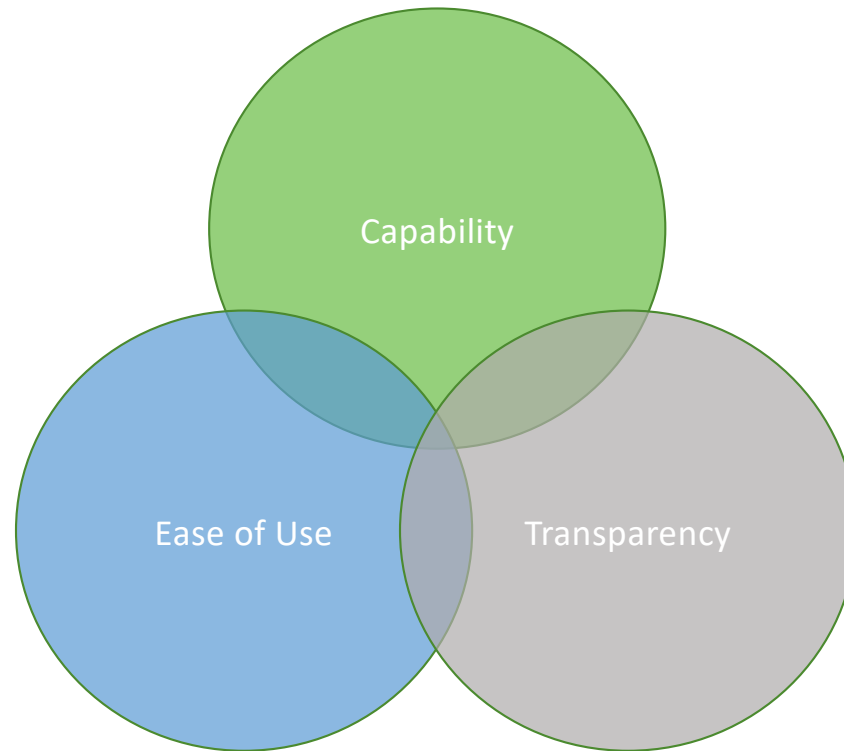
UPCOMING FEATURES



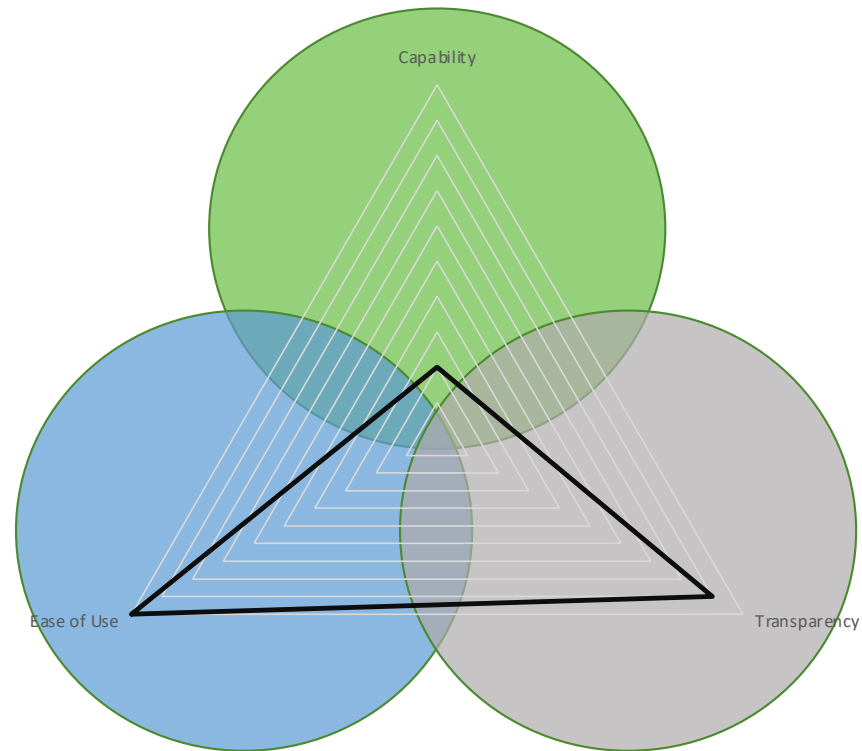
What is PlantPredict



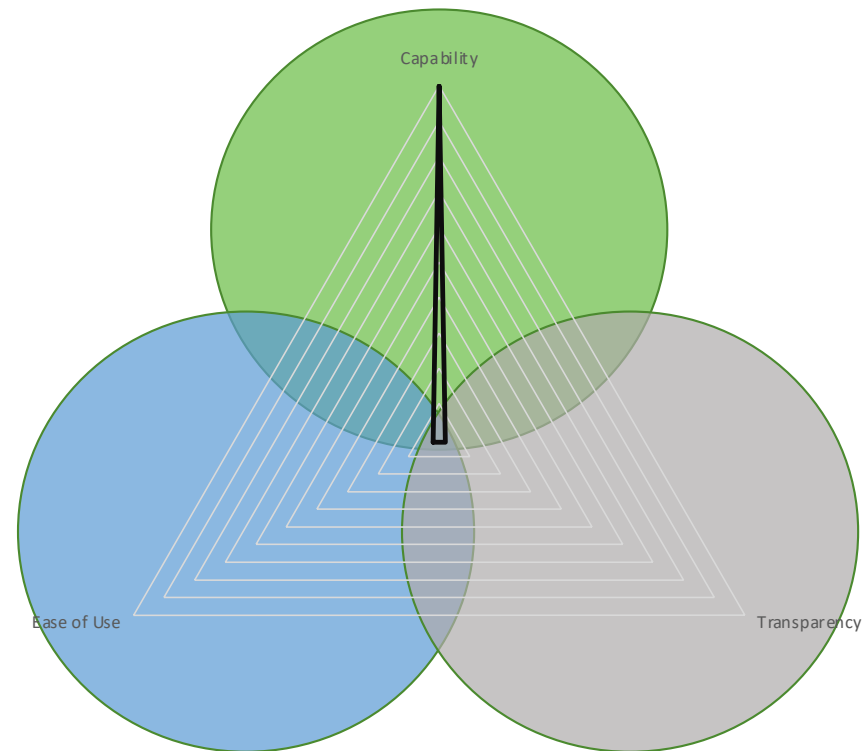
THE IDEAL SOLAR PERFORMANCE MODELING SOFTWARE



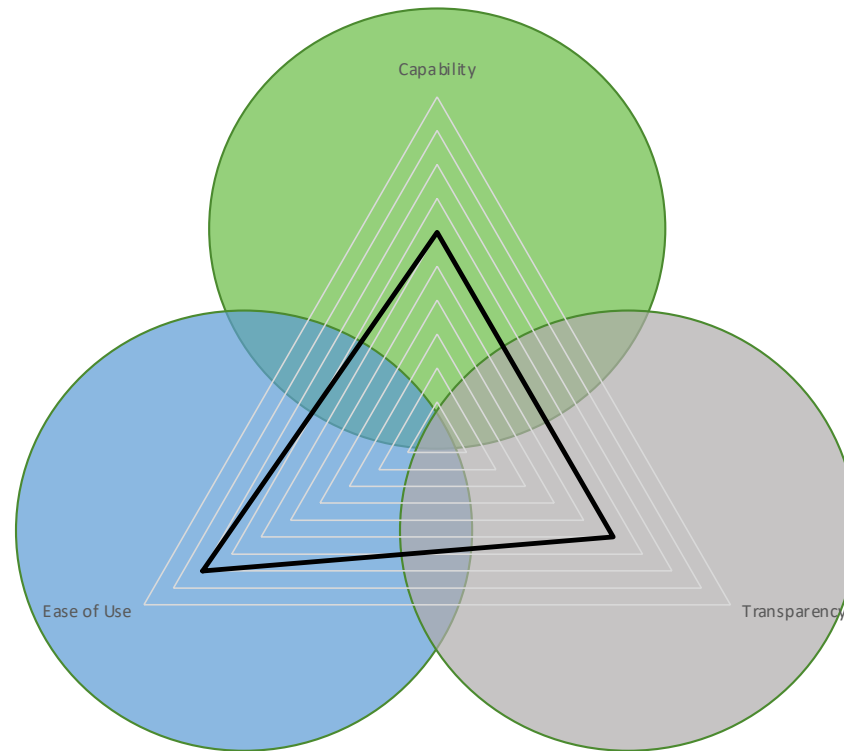
PVWATTS



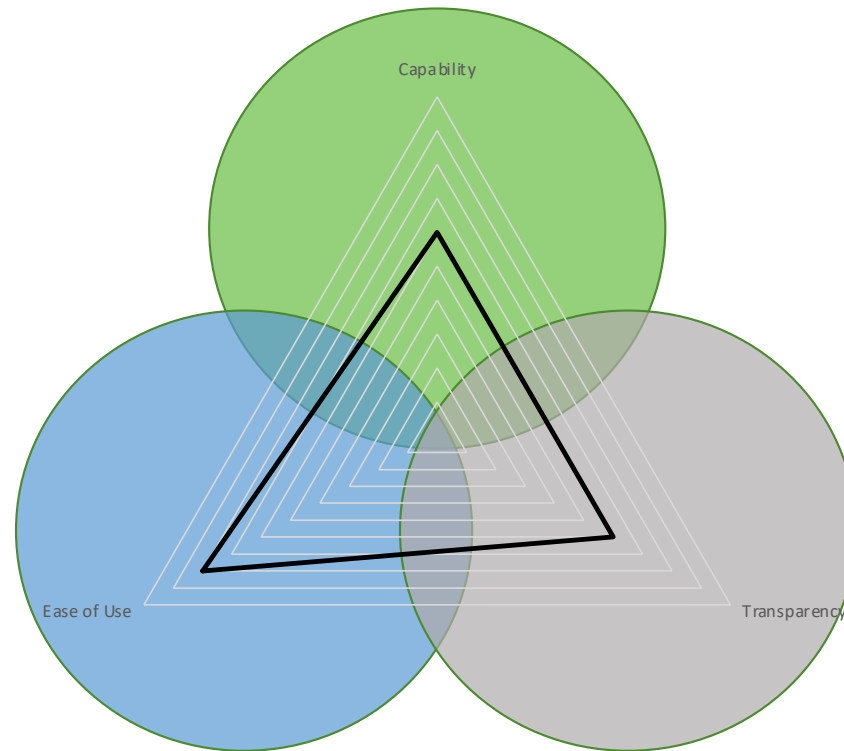
CUSTOM SOFTWARE DEVELOPMENT



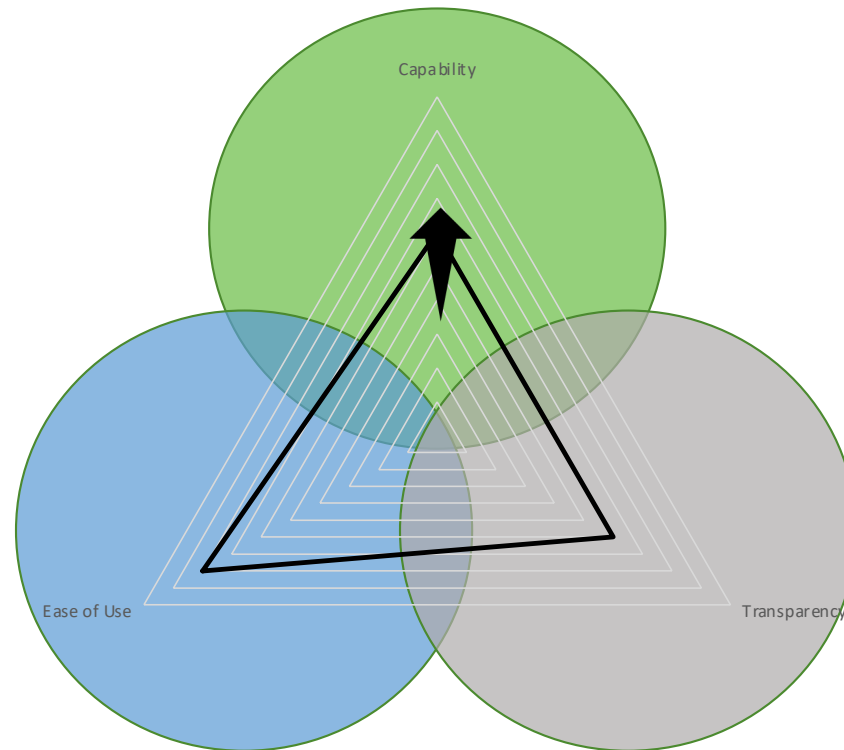
PLANTPREDICT



PLANTPREDICT



PLANTPREDICT





Cloud Based
Performance Model



Database
Backed



Prediction Engine
Versions



Regression Testing



API/SDK



GIS Enabled



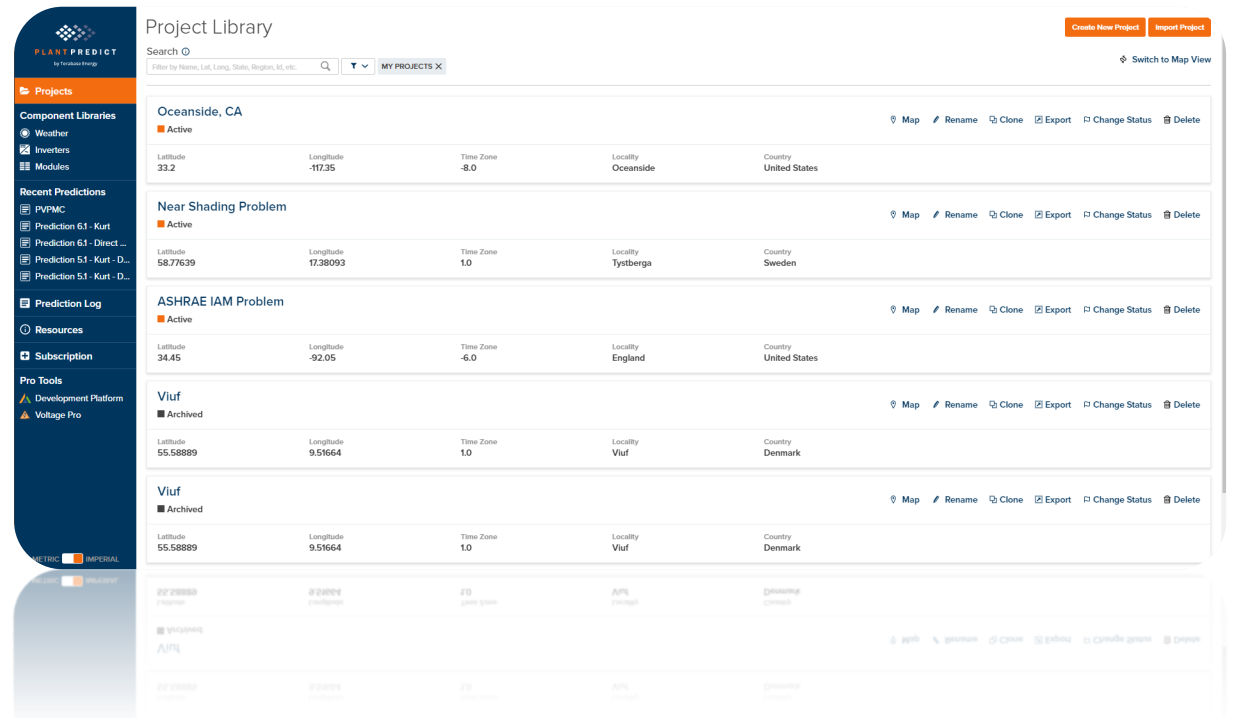
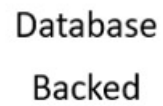
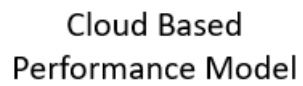
Any Time-step



Third Party Validated



Ecosystem





Any Time-step

PLANTPREDICT
by Tetrasys Energy

Projects

Component Libraries

Weather

Inverters

Modules

Recent Predictions

PVPMC

Prediction 61 - Kurt ...

Prediction 51 - Kurt - D...

Prediction 51 - Kurt - D...

Prediction Log

Resources

Subscription

Pro Tools

Development Platform

Voltage Pro

METRIC IMPERIAL

Importing Weather

Continue Import

Back Cancel

DEFINE LOCALITY

SET PARAMETERS

FORMAT DATA

QUALITY CHECK

Provide Values

Please enter the amount monthly or hourly averages for the following data points.

Variables

Timestamp

Header Rows to Skip

1

☒ GHI

W/m²

7

☐ DNI

W/m²

☒ DHI

W/m²

8

☐ POAI

W/m²

☐ Backside POAI

W/m²

☒ TEMP

°C

11

☐ Windspeed

m/s

☐ Relative Humidity

%

☐ PWAT

cm

☐ Rain

mm

☐ Pressure

mbar

☐ Dewpoint Temp

°C

☐ Wind Direction

°

☐ Soiling Loss

%

** Required

2019-01-01 01:00:00 2019 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 4.9 | -2.1 | 16375 || 2019-01-01 01:05:00 | 2019 | 1 | 1 | 1 | 5 | 0 | 0 | 0 | 4.9 | -2.1 | 1630 |



Prediction Engine Versions



Regression Testing

Projects > Oceanside, CA > PVPMC

PVPMC

Draft - Shared Kurt Rhee | 6 Apr 2023

Favorite Rename Clone Export Change Status Delete

Run Prediction

MWac: 5.225 MWdc: 9.4 DC/AC: 1.8 Mounting: Horizontal Tracker GCR %: 40 %

More v

Environmental Conditions

Weather Data
Solling, Albedo, Design Temperatures [Update](#)

Time Series Data
Inverter Set Point/Design Derate, Tracker Angle, Surface Temp., LGIA Limit [Add](#)

Power Plant Specifications

PV Blocks & Arrays
DC Fields, Inverters, Transformer [Quick Edit](#) [Update](#)

Energy Storage System
Battery, Inverter, Transformer [Add](#)

System Details
Substation, Transmission, Interconnection [Edit](#)

Simulation Settings

Model Choices
Transposition, Spectral, Degradation [Update](#)

Ready to Run

You've met the data requirements necessary to run a prediction.

- Environmental Conditions
- Power Plant Specifications
- Simulation Settings

[Run Prediction](#)

Model Data: **Yes** [Options](#)

Prediction Logic: **Version 10** [Confirm](#) [Cancel](#)

Prediction Notes [Add](#)



Third Party Validated





API/SDK

ENVIRONMENTproductionLAYOUTDouble ColumnLANGUAGEPython - Requests

PLANTPREDICT API

Introduction

1 - API Overview

2 - Authentication

Definition

Projects

Project

GET Project

POST Project

PUT Project

DEL Project

GET My Projects

GET Overview

GET Search

Prediction

PowerPlant

Time Series Data

Results

Financial Model

Weather

Inverter

Module

ASHRAE

Reports

System

GET Project

https://api.plantpredict.terabase.energy/Project/76494

Get a specified Project's properties.

AUTHORIZATION OAuth 2.0

This request is using OAuth 2.0 from collection PlantPredict API

POST Project

https://api.plantpredict.terabase.energy/Project

Create a new Project.

curl -X POST -H "Content-Type: application/json" -d '{"name": "Test Project"}' https://api.plantpredict.terabase.energy/Project

201 Created

Example Request

python

import requests

url = "https://api.plantpredict.terabase.energy/Project/76494"

payload={} headers = {}

response = requests.request("GET", url, headers=headers, data=payload)

print(response.text)

Example Response

Body Headers (14) 200 OK

json

{

"latitude": 41.6620862,

"longitude": -83.6370674,

"country": "United States",

"countryCode": "US",

"stateProvince": "Ohio",

"stateProvinceCode": "OH",

"locality": "Toledo",

"region": "North America",

"elevation": 170.64803766666666,

}

View More

Example Request

python

import requests

url = "https://api.plantpredict.terabase.energy/Project"

payload={} headers = {}

response = requests.request("POST", url, headers=headers, data=payload)

print(response.text)



Power Plant Builder

Projects: 3 | Coordinates: CA 7 | Map 3 | Map Builder

Switch to Block Builder

3D View | Exposure Analysis | PLP-1000 | Bill of Materials | Upload Data | Download Data

Save Progress | Close

Projects

Component Libraries

- Weather
- Inverters
- Modules

Recent Predictions

- PVPMC
- Prediction 6.1 - Kurt
- Prediction 6.1 - Direct ...
- Prediction 5.1 - Kurt - D...
- Prediction 5.1 - Kurt - D...

Prediction Log

Resources

Subscription

Pro Tools

- Development Platform
- Voltage Pro

METRIC IMPERIAL

Map Overlays

- ☐ Flood Hazard Zones (USFEMA)
- ☒ Wetlands-Vectors (USFWS)
- ☐ Parcels
- ☒ Roadways/Railways (Census)
- ☐ Survey
- ☒ KML Import
- ☒ Site Boundaries
- ☒ DC Flood
- ☒ Constraints
- ☒ Transmission Lines
- ☐ Substations
- ☐ Crude Oil Pipelines

Update DC Capacity

Site Specifications | Cut-Fill Data

Estimated	Boundary	MWAC	MWDC	DCAC Ratio (Actual)	Buildable Area	Array Area	Site Capacity	Boundary Utilization
268.56 acres	350.57 acres	49.64	59.99	1.209	230.82 acres	190.72 acres	62.07 MWDC	54.4 %

350.57 acres boundary | 49.64 MWAC | 59.99 MWDC | 1.209 DCAC ratio (actual) | 230.82 acres buildable area | 190.72 acres array area | 62.07 MWDC site capacity | 54.4 % boundary utilization

350.57 acres boundary | 49.64 MWAC | 59.99 MWDC | 1.209 DCAC ratio (actual) | 230.82 acres buildable area | 190.72 acres array area | 62.07 MWDC site capacity | 54.4 % boundary utilization





New Features

2023



CIRCUMSOLAR ALLOCATION

Capability

Ease of Use

PLANT PREDICT
by Terabase Energy

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METRIC IMPERIAL

Home

Help

Log Out

Projects > Oceanside, CA > PVPMC > Model Choices

Simulation Settings

Set your parameters for this specific prediction

Save + Close Simulation Settings

Save Progress Cancel

Timeframe

Start Date
01 Jan 2010 00:00

End Date
31 Dec 2010 23:00

Weather File Name
NSRDB - 33.21N - 117.34W

Start Date
1 Jan 2010

End Date
31 Dec 2010

Time Step
60 min

Duration
1 year

Irradiance Models

Weather File ON Frontside POA Backside POA

OFF ON OFF ON OFF ON

Air Mass
Bird-Hulstrom

Decomposition
DIRINT

Transposition
Perez

Circumsolar Treatment
Diffuse

Module Related Models

Incidence Angle
Tabular IAM

Spectral
2-Param Pwat and AM

Module Temperature
Heat Balance

Soiling
Constant Monthly

Shading Models

Direct Shading
Module File Defined Shading

Diffuse Shading
OFF ON

Experimental

Spectral 3.0
OFF ON

Degradation

Number of Years
1



When modeling the performance of a utility scale photovoltaic power plant would it be more appropriate to model the circumsolar portion of irradiance as beam or diffuse?

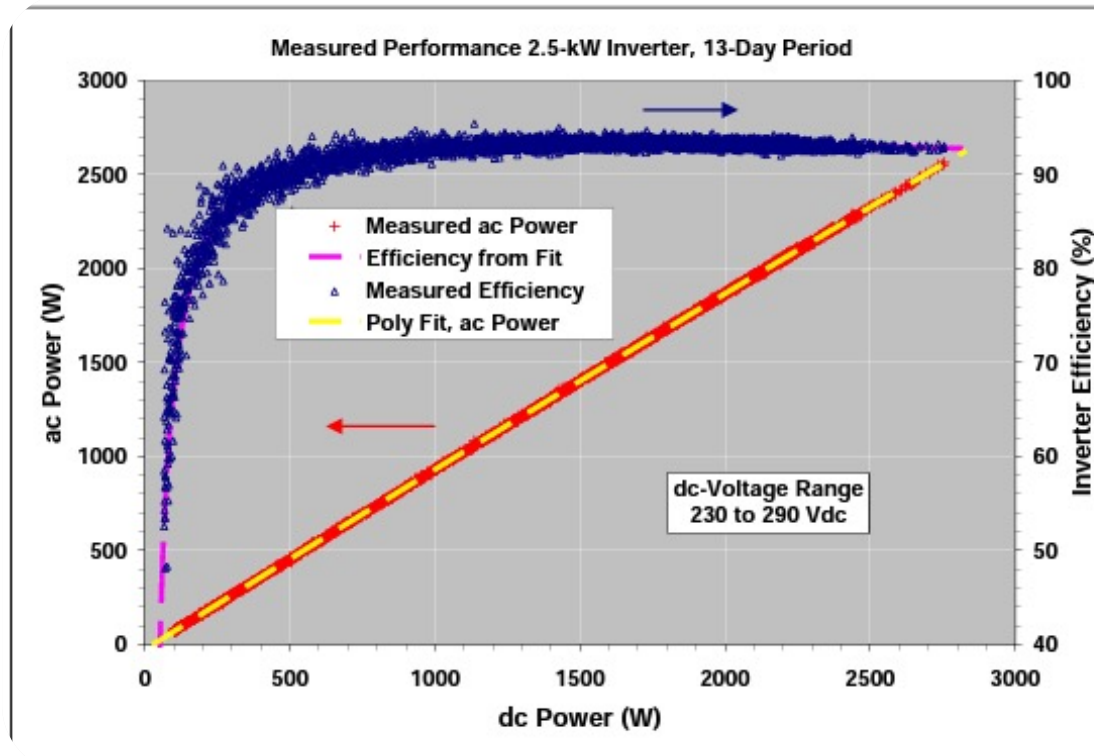


When modeling the performance of a utility-scale photovoltaic power plant, it is more appropriate to model the circumsolar portion of irradiance as beam radiation rather than diffuse radiation.



SANDIA INVERTER EFFICIENCY MODEL

Capability



PLANNED: DIFFUSE IRRADIANCE OPTIMIZATION

Capability

$$\theta_c = [(1 - \mu - \eta) * \theta_i] + [\mu * (0.5 * (\theta_i + \theta_s))] + [\eta * \theta_s]$$

θ_c = corrected tracker angle [degrees] [minimum rotation angle to maximum rotation angle]

θ_i = idealized tracker angle [degrees] [minimum rotation angle to maximum rotation angle]

θ_s = tracker angle without irradiance optimization [degrees] [minimum rotation angle to maximum rotation angle]

μ = movement penalty [percent] [0 to 100]

η = hesitation factor [percent] [0 to 100 - μ]

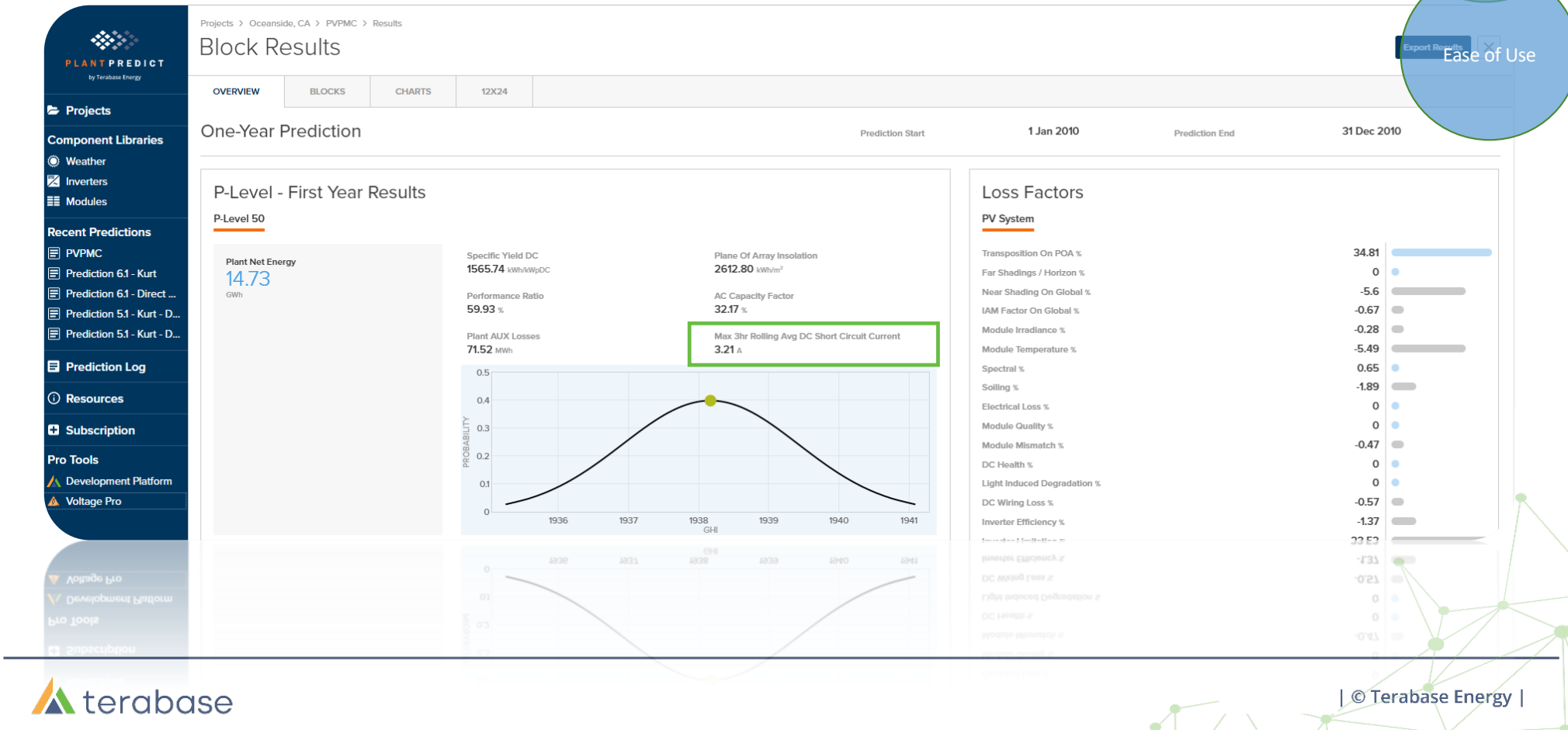


https://groups.google.com/g/pvlib-python/c/uYqWRpz_cwk/m/SfVdLyGjAAAJ?utm_medium=email&utm_source=footer

NEW IN PLANTPREDICT: 3HR ROLLING AVG. ISC

Capability

Ease of Use



PVGIS HORIZON API

Ease of Use

PLANTPREDICT
by Terabase Energy

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Prediction Log

Resources

Subscription

Pro Tools

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- Voltage Pro

Projects > Oceanside, CA > PVPMC > Environmental Conditions

Environmental Conditions

Set the weather you would prefer to use below.

Save + Close Section

Cancel

Selected Weather File

NSRDB - 33.21N - 117.34W

Global System Account | 13 Mar 2023

Change Selection

Data Type	GHI	DNI	Avg. Temp	P-Level
PSM	1938.17 kWh/m ²	521.08 kWh/m ²	64.922 °F	P50

Monthly Parameters

MONTH	ALBEDO	SOILING LOSS (%)
January	0.2	2
February	0.2	2
March	0.2	2
April	0.2	2
May	0.2	2
June	0.2	2
July	0.2	2
August	0.2	2
September	0.2	2
October	0.2	2
November	0.2	2
December	0.2	2

Annual Override

Import NSRDB Albedo

Spectral Override

Plant Design Temperature

TIMEFRAME	AVERAGES
50 Year Max (°F)	107.96000000000001 °F
50 Year Min (°F)	23.72 °F
99.6 Cooling (°F)	85.64 °F
Annual Mean Min. Dry Bulb (°F)	30.2 °F

Station: 722934 OCEANSIDE, CA, USA
Distance Away: 1.31 mi
© 2021 Astron, www.astron.org. Used with permission.

Override Recommendations

Horizon Scene

AZMUTH (°)	ELEVATION ANGLE (°)
<div>Add Horizon Data</div>	<div>Import PVGIS Scene</div> <div>Import Metronom Scene</div>

terabase

| © Terabase Energy |

NEW DOCUMENTATION



Ease of Use

Transparency

Terabase Help Center / Terabase Support / PlantPredict models and algorithms / PlantPredict Documentation

Welcome to PlantPredict's Models and Algorithms Documentation Page

In the pages below, you will find technical descriptions of PlantPredict's underlying prediction engine. Documentation regarding software architecture, user interface and implementation details are excluded. If there are algorithms which are missing or you wish were described in fuller detail, please let us know so that we can expand our descriptions.

i PlantPredict is currently in the process of moving our models and algorithms documentation to this new format.

Feature Roadmap

1. Irradiance optimization (diffuse stow) algorithm.
2. Far shadings on diffuse.
3. New Detailed Block Builder.

Models and Algorithms

- General
- GIS
- Solar Position
- Mounting
- Irradiance
- Optical Losses
- DC Behavior
- AC Behavior
- Energy Storage Behavior
- Outputs

ACCESSIBLE COLOR PALETTE

Ease of Use

The screenshot shows the 'Profile' page of the 'PLANT PREDICT by Terabase Energy' application. The 'ACCESSIBILITY OPTIONS' tab is active, displaying the 'Graph Color Palette' section. Two palettes are shown: 'Default Color Palette' (with colors: olive, maroon, brown, blue, grey) and 'Bang Wong Accessibility Palette' (with colors: blue, orange, light blue, green, yellow). The 'Bang Wong Accessibility Palette' is selected with a radio button.



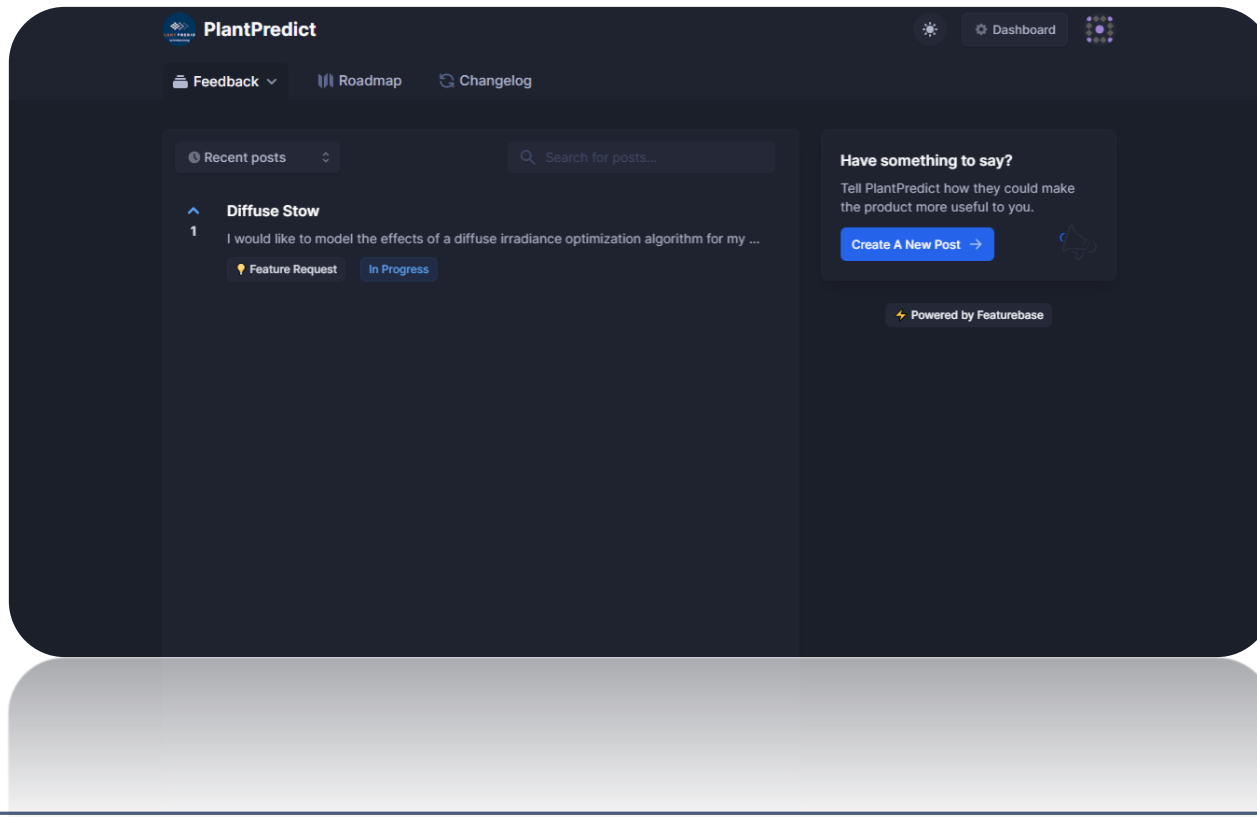
Upcoming

2023

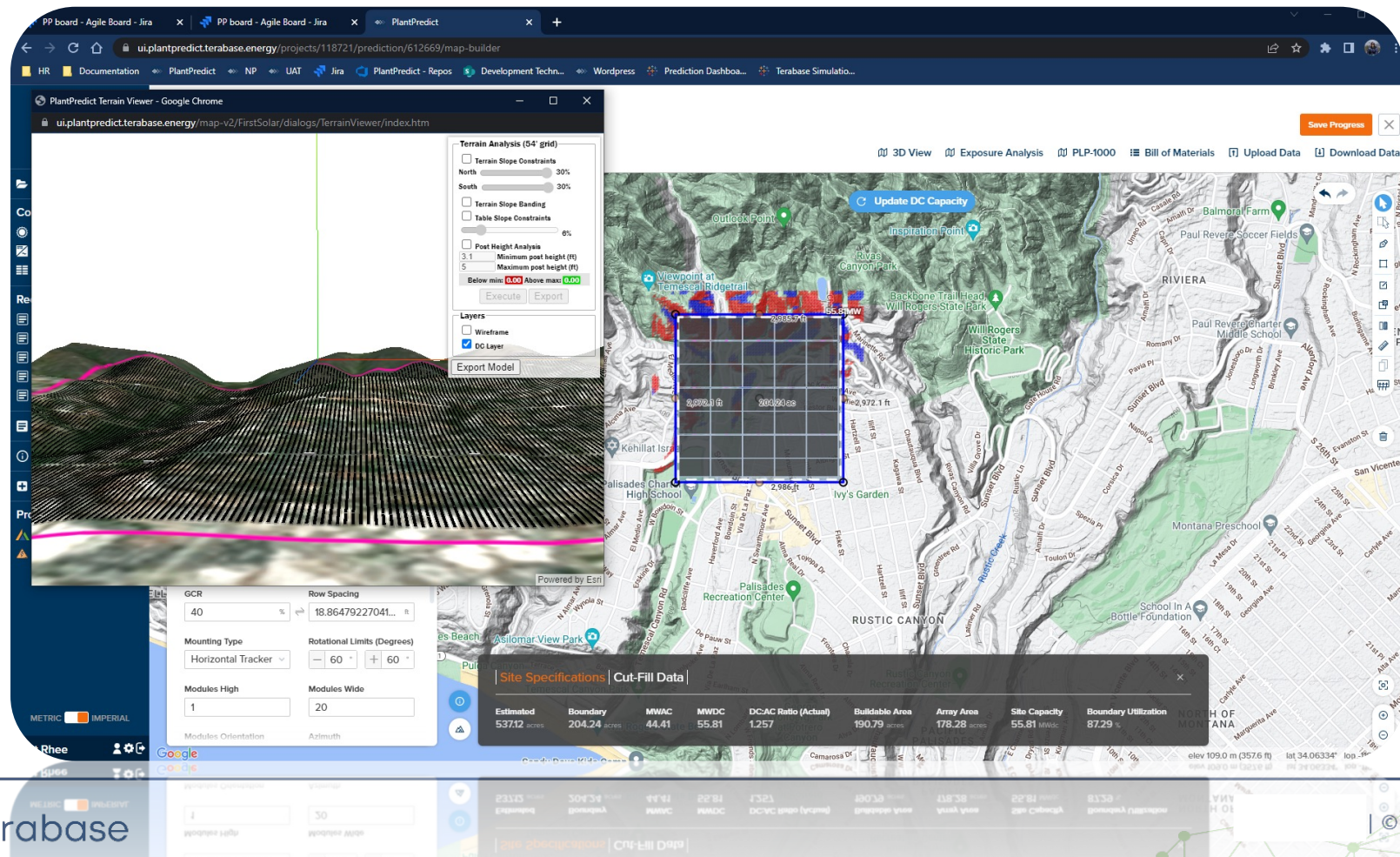


FEATURE REQUESTS

Transparency



PLANNED: NEW 3D SHADE MODEL





terabase
ENERGY