Praia solar thermal energy

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So far, we have conducted calculations to evaluate the solar photovoltaic (PV) potential in 4 locations across Cabo Verde. This analysis provides insights into each city/location"s potential for harnessing solar energy through PV installations.

Seasonal solar PV output for Latitude: 14.923, Longitude: -23.508 (Praia, Cabo Verde), based on our analysis of 8760 hourly intervals of solar and meteorological data (one whole year) retrieved for that set of coordinates/location from NASA POWER (The Prediction of Worldwide Energy Resources) API:

To maximize your solar PV system"s energy output in Praia, Cabo Verde (Lat/Long 14.923, -23.508) throughout the year, you should tilt your panels at an angle of 13° South for fixed panel installations.

As the Earth revolves around the Sun each year, the maximum angle of elevation of the Sun varies by +/- 23.45 degrees from its equinox elevation angle for a particular latitude. Finding the exact optimal angle to maximise solar PV production throughout the year can be challenging, but with careful consideration of historical solar energy and meteorological data for a certain location, it can be done precisely.

We use our own calculation, which incorporates NASA solar and meteorological data for the exact Lat/Long coordinates, to determine the ideal tilt angle of a solar panel that will yield maximum annual solar output. We calculate the optimal angle for each day of the year, taking into account its contribution to the yearly total PV potential at that specific location.

If you can adjust the tilt angle of your solar PV panels, please refer to the seasonal tilt angles below for optimal solar energy production in Praia, Cabo Verde. As mentioned earlier, for fixed-panel solar PV installations, it is optimal to maintain a 13° South tilt angle throughout the year.

Our recommendations take into account more than just latitude and Earth"s position in its elliptical orbit around the Sun. We also incorporate historical solar and meteorological data from NASA"s Prediction of Worldwide Energy Resources (POWER) API to assign a weight to each ideal angle for each day based on its historical contribution to overall solar PV potential during a specific season.

This approach allows us to provide much more accurate recommendations than relying solely on latitude, as it considers unique weather conditions in different locations sharing the same latitude worldwide.

The topography around Praia, the capital city of Cabo Verde, is characterized by a mix of coastal lowlands and rugged, volcanic terrain. Praia itself is situated on a plateau overlooking the Atlantic Ocean, with an elevation of about 30 meters above sea level. The city is surrounded by a series of hills and small mountains, which are remnants of ancient volcanic activity.

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To the north and west of Praia, the landscape becomes more mountainous, with steep slopes and rocky outcrops. The highest point on Santiago Island, where Praia is located, is Pico da Ant?nia, which reaches an elevation of approximately 1,394 meters. This peak is situated about 20 kilometers northwest of the city.

The coastline near Praia features a mix of rocky cliffs and sandy beaches. To the east and southeast of the city, the terrain is generally flatter, with some areas of gently rolling hills. This region is more arid and experiences less rainfall than the mountainous interior of the island.

For large-scale solar PV installations, the areas most suited would likely be the flatter, more open spaces to the east and southeast of Praia. These regions offer several advantages for solar energy production: