

# Highest solar capacity factor





## Overview

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RWE's 20 MWp Schönewitz solar farm in Saxony, Germany, was commissioned in Feb 2025. Consisting of 36,000 bifacial solar modules, it is expected to produce around 21mn kWh of electricity. Those figures produce a capacity factor of 10.9%, substantially higher than the German average of 8.5%. Photo: RWE.

The capacity utilization factor (CUF) is one of the most important performance parameters for a solar power plant. It indicates how much energy a solar plant is able to generate compared to its maximum rated capacity over a period of time. Tracking CUF allows solar plant owners and operators to.

Capacity factor is estimated for 10 resource classes, binned by mean global horizontal irradiance (GHI) in the United States. The 2024 ATB presents capacity factor estimates that encompass a range associated with advanced, moderate, and conservative technology innovation scenarios across the United.

\* The Desert Southwest continues to dominate top-ranked states by solar capacity factor, and as well as its solar-energy-friendly climate, now offers the added benefit of many areas qualifying as energy communities under the Inflation Reduction Act of 2022. \* Independent System Operators, or ISOs.

Enter the Capacity Utilization Factor (CUF), a critical metric that reveals how much energy a solar power plant pumps out compared to its full potential over time. It's not just a nerdy number; it's the pulse of a solar project's efficiency,



profitability, and real-world impact. Whether you're.

Based on 2018 data from the Independent Electricity System Operator (IESO), the 100MW Sol-Luce solar farm in Kingston Ontario the capacity factor was 17% in 2018. Using the U.S. Energy Information Administration (EIA) data from 2015 to 2018 for the 550MW Topaz solar farm in southern California, it. What is a solar capacity factor?

The capacity factor refers to the ratio of the actual energy output of a solar plant over a period of time compared to its maximum possible output if it had operated at full nameplate capacity for the same time period. It captures the plant's utilization over time, accounting for variability and intermittency.

What is the capacity utilization factor (CUF) of a solar power plant?

The capacity utilization factor (CUF) is one of the most important performance parameters for a solar power plant. It indicates how much energy a solar plant is able to generate compared to its maximum rated capacity over a period of time.

What is the average capacity factor for different power sources?

According to the EIA, the average capacity factor for different power sources is as follows: a hydroelectric plant is 36-43%, a nuclear plant is 91-93%, a solar plant is 24-26%, and a wind plant is 32-35%, a coal plant is ~41-61% and a combined cycle gas plant is ~49-57%.

What is a power plant capacity factor?

Capacity factor, or more accurately net capacity factor, is the ratio of the actual electricity output of a power plant over a period of time relative to the theoretical maximum electricity output of a power plant over a period of time.

What is the capacity factor of a solar farm?

Based on 2018 data from the Independent Electricity System Operator (IESO), the 100MW Sol-Luce solar farm in Kingston Ontario the capacity factor was 17% in 2018. Using the U.S. Energy Information Administration (EIA) data from 2015 to 2018 for the 550MW Topaz solar farm in southern California, it had an average capacity factor of 26.7%.

What are the different types of solar capacity factor maps?



Solar photovoltaic, concentrated solar power, wind (150 metre hub height) and hybrid wind and solar capacity factor maps are included in this dataset. All maps are available for download in geotiff format. Solar Photovoltaic capacity factor map The minimum capacity factor is <10% and the maximum is 25%.



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### [Solar Photovoltaic Power Potential by Country](#)

The potential for clean, carbon-free electricity generation from solar photovoltaic (PV) sources in most countries dwarfs their current electricity demand. Around 20% of the global population lives in 70 countries boasting excellent conditions ...

### [Shining a light on solar capacity factors . Energy ...](#)

Claire Cortis, Digital Knowledge and Information Manager at the Energy Institute, compares solar capacity factors of the top 20 solar PV generating countries and looks at the technologies being developed that could ...



### **Usual sun states shine bright at top of US solar capacity factor**

The weighted average U.S. solar capacity factor stayed flat year over year in 2021. This possibly reflected greater operational efficiency, as more than 58% of the states individually operating in ...

## Solar capacity and capacity factor

As I described in my wind energy capacity article, there are two different ways to describe generation capacity. The capacity represents the rated output of a generator for a prescribed set



of conditions which is typically the maximum ...



### [What is Capacity Factor? A Beginner's Guide](#)

The three types of capacity factors are the nameplate generation capacity, net summer generation capacity, and net winter generation capacity. A manufacturer determines the nameplate generation capacity and ...

### **Capacity factors representative for every region in Spain. Average**

Download scientific diagram , Capacity factors representative for every region in Spain. Average values over the 39 years of available data are shown. Grey dots indicate the spatial resolution ...



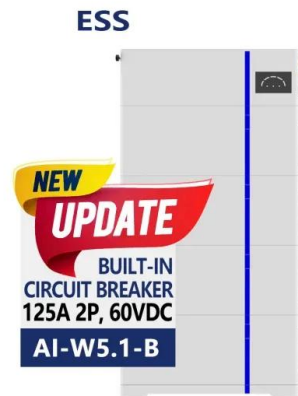
### [How to Calculate Solar Power Plant Capacity Factor](#)

The capacity utilization factor (CUF) of a solar power plant is calculated by dividing the actual energy generated by the plant over a given time period, by the maximum possible energy that could have been generated at ...



## [High-frequency standard deviation of the capacity ...](#)

Abstract It is important to secure for every solar photovoltaic energy installation the highest-possible average (mean) capacity factor, as well as the lowest-possible SD, this latter computed with high frequency. High ...

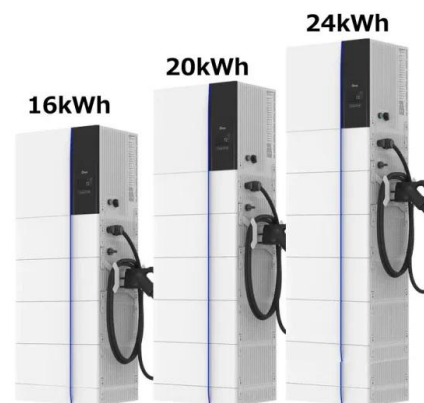


## [Utility-Scale PV , Electricity , 2023 , ATB , NREL](#)

Average capacity factors are calculated using county-level capacity factor averages from the reV model for 1998-2021 (inclusive) of the NSRDB. The NSRDB provides modeled spatiotemporal solar irradiance resource data at 4 ...

## Capacity factors for electrical power generation from ...

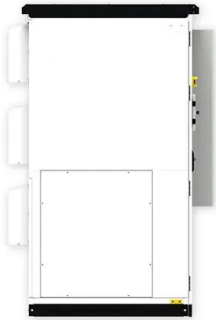
Capacity factor (CF) is a direct measure of the efficacy of a power generation system and of the costs of power produced. Since the year 2000, the explosive expansion of solar PV and wind power made their CFs more reliable.



## Monthly generator capacity factor data now available ...

EIA's new tables include capacity factors for individual renewable generating technologies (see chart below). Geothermal and waste technologies operate fairly steadily and at high capacity factors. Intermittent ...





### Usual sun states shine bright at top of US solar capacity factor

Solar capacity leader California ISO extended its lead, up 50 basis points year over year, averaging a factor of 27.3%. Midcontinent ISO, New York ISO and PJM also ended in positive ...



### Why capacity factor is an increasingly simplistic way ...

Dan Lee explains why capacity factor could be becoming an increasingly less useful measure for comparing how different solar farms are performing and begins an exploration into some of the factors in play when trying to conduct ...

### Solar power by country

Yearly solar generation by continent [2] Solar generation by country, 2021 [2] The following table lists these data for each country: Total generation from solar in terawatt-hours. Percent of that country's generation that was solar. Total solar ...







### [Southwestern states have better solar resources and ...](#)

Three main factors largely determine a solar PV power plant's capacity factor: resource quality, tracking capabilities, and inverter-sizing considerations. Sunnier locations, such as in the southwestern United States, ...

### **Why capacity factor is an increasingly simplistic way to compare solar**

Dan Lee explains why capacity factor could be becoming an increasingly less useful measure for comparing how different solar farms are performing and begins an exploration into some of the ...



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