



# Zambia Solar Report

## Prepared by J.v.G. Technology GmbH

J.v.G. Technology GmbH is a German engineering company specializing in turnkey solar module production lines and manufacturing consulting, with project experience ranging from 20 MW to 500 MW per production line, including multi-line and gigafactory projects exceeding this scale.

This Solar Report is part of the **PVKnowHow** Knowledge Network.  
The data, analysis, and conclusions in this document are based on real research, consulting insights, and international solar market data.

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Gain comprehensive insights into the statistics and metrics surrounding the solar production industry in Zambia

## KEY POINTS

All figures have been converted into USD



## Yearly sunshine (sun hours per year)

Yearly Sunshine:

- Average yearly sunshine in hours: 3000 hours
- Peak sunshine hours per day: 5.5 hours



**kWh per kWp installed**

kWh per kWp:

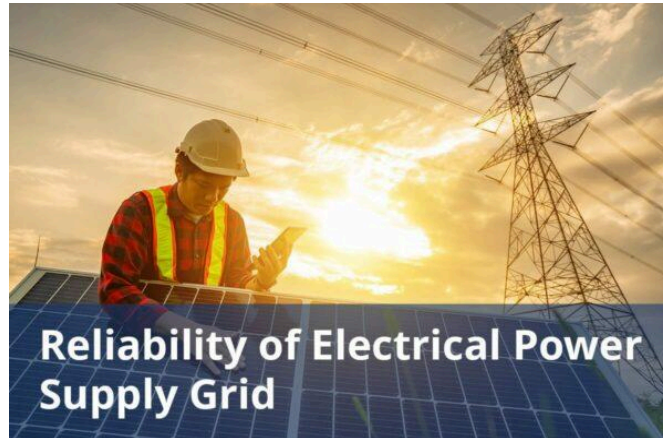
- Conversion factor: 1000 kWh/kWp



**Average cost per kWh from utility company**

Average Cost Per kWh:

- Residential average: \$0.135/kWh
- Commercial average: \$0.120/kWh
- Industrial average: \$0.110/kWh



## Reliability of electrical power supply grid

Reliability:

- System reliability rate: 99.9%
- Expected system lifespan: 25 years



# DETAILED INFORMATION

All figures have been converted into USD

## Total solar panel production capacity (installed)

Total Solar Panels Installed:

- Total number of panels: 1,200,000
- Total capacity installed: 3,600 MW

### **Total solar panel production capacity (projected)**

Total Solar Panels Projected:

- Projected installations by 2030: 2,500,000
- Projected capacity by 2030: 7,500 MW

### **Average costs of various electricity generation sources (coal, natural gas, solar, etc)**

Average Costs:

- Average installation cost: \$2.50/W
- Maintenance cost per year: \$20 per panel

### **Percentages of various electricity generation sources (coal, natural gas, solar, etc)**

Percentages of Electricity:

- Solar power contribution to total electricity: 20%
- Wind power contribution: 15%
- Other renewable sources: 10%

## **Average daily availability of electricity from the national grid (measured in hours)**

Daily Availability:

- Expected daily generation: 4 kWh/kWp
- Panel angle optimization: 30 degrees

## **Number of residential solar panel installations**

Number of Residential Panels:

- Total residential panels: 800,000
- Average number of panels per household: 6

## **Total number of solar farms (installed and projected)**

Number of Farms:

- Total solar farms in operation: 150
- Average size of solar farm: 50 MW

## **Off-grid market demand for solar panels (current and projected)**

Off-grid market demand for solar panels (current and projected):

The current off-grid solar capacity in Zambia includes both installed and projected capacities from various initiatives. Significant projects are underway to increase access to clean energy through mini-grids and solar lighting solutions.

### Installed Capacity:

- Zambia has a notable presence of off-grid solar solutions. Companies like Namene have distributed over 720000 pico solar lights across the country, greatly enhancing energy access in rural areas
- Zambian Rising Sun, supported by the Beyond the Grid Fund for Africa (BGFA), plans to build 11 solar-based mini-grids with capacities ranging from 50 kWp to 200 kWp. These mini-grids aim to provide electricity to approximately 19000 people by the end of 2027

### Projected Capacity:

- By 2030, the goal is to establish 100 mini-networks in Zambia, significantly boosting off-grid solar capacity. These efforts are part of a broader initiative to achieve universal access to clean energy.

## **On-grid market demand for solar panels (current and projected)**

On-grid market demand for solar panels (current and projected):

As of 2024, Zambia has made substantial progress with various renewable energy projects, particularly in grid connected solar power systems. The country has installed solar capacities totaling around 124 MW and is planning further expansions.

Increase urban electrification to 100% by 2030, up from the current rate of 68%.

## **Average monthly income of workers in solar industry (labor cost)**

Average monthly income of workers in solar industry (labor cost):

The average salary of workers in the solar industry includes:

- Electrical Engineer: 150-300 USD
- Electrician: 100-200 USD
- Design Engineering Manager: 450-600 USD
- Solar Engineer: 200-400 USD
- Solar Energy / Solar Power Engineer: 200-400 USD

## **Population of the country**

Population of the country:

The population of Zambia is approximately 21376880 as of 2024.

## **Average overhead costs of solar panel production (with a brief breakdown)**

Average overhead costs of solar panel production (with a brief breakdown):

The average overhead costs of solar panel production in Zambia encompass several key components. Labor costs for operating machinery and assembling panels are significant, often influenced by local wage rates. Overhead costs, including utilities and facility maintenance, also play a crucial role.

Labor Costs:

- Minimum Wage:
  - Public Sector: Around \$100 USD per month
  - Private Sector (non-agricultural): \$150 USD per month

Utilities Charges:

- Electricity Cost:

- As of September 2023, the price of electricity for households in Zambia was USD 0.022/kWh

- The electricity price for businesses was USD 0.033/kWh

Water Charges:

- Effective January 1, 2017, water tariffs increased across various categories. For domestic metered customers, USD 0.15/m<sup>3</sup>.

Facility Maintenance:

- Maintaining the manufacturing facilities, including rent, equipment maintenance, and repairs, typically ranges from \$1000 to \$3000 per month.

## **A summary of the energy infrastructure**

A summary of the energy infrastructure:

Zambia's energy infrastructure is predominantly based on hydroelectric power, with major contributions from the Kariba Dam on the Zambezi River, Kafue Gorge, and Victoria Falls hydroelectric plants. As of the latest data, the country's energy mix is as follows: 83% hydropower, 8.7% thermal, 2.9% heavy fuel oil, 2.2% diesel, and 3.2% solar photovoltaic.

Despite this reliance on hydro power, Zambia experiences periodic power shortages due to droughts affecting water levels. To mitigate these challenges and diversify its energy sources, Zambia is investing in solar power projects and exploring thermal power from coal and biomass. Ongoing infrastructure improvements focus on modernizing the grid, expanding generation capacity, and enhancing transmission and distribution networks.

# **Some of the government regulations surrounding solar panel production**

Some of the government regulations surrounding solar panel production:

**Draft Net Metering Regulations (2022):** The Energy Regulation Board (ERB) issued draft regulations allowing households and businesses to generate their own electricity and export excess to the grid. This policy encourages solar panel adoption and reduces reliance on the national grid.

**Integration of Different Power Sources:** Zambia's energy mix includes hydro, solar, and other renewable sources. The country is working towards integrating these different sources to ensure a reliable and sustainable energy supply.

**Manufacturing Standards:** Zambia has regulations in place to ensure the quality and safety of solar panels and other renewable energy technologies.

## **Government initiatives in solar panel production (includes investments and subsidies)**

Government initiatives in solar panel production (includes investments and subsidies):

**Rural Electrification Fund (REF):** This fund is managed by the Rural Electrification Authority (REA) and is aimed at implementing the rural electrification programme in Zambia.

Duty and VAT Exemptions: The Zambian government has made certain aspects of solar products duty and VAT exempt. Energy efficient lighting lamps, discharge lamps, solar batteries and inverters for solar power are duty free.

Renewable Energy Feed-in Tariff (REFIT) Strategy: This strategy started in 2017 and is specifically implemented to support renewable energy sources.

## **Notable solar projects in the country (installed and projected)**

Notable solar projects in the country (installed and projected):

Notable solar projects in Zambia are as follows:

Installed Projects:

- Bangweulu Solar Park: 54 MW, Kafue District, Lusaka Province.
- Ngonye Solar Park: 34 MW, Kafue District, Lusaka Province.
- Itimpi Solar Power Station: 60 MW, Kafue District, Lusaka Province.
- Zambia Riverside Solar Power Station: 34 MW, Kafue District, Lusaka Province.

Projected Projects:

- Chunga Solar Project: Location: Chunga, Expected Capacity: 120 MW
- Kafue Solar Project: Location: Kafue, Expected Capacity: 50 MW
- Serenje Solar Power Station: Kosamu Village, Chitambo District, Expected Capacity: 200 MW
- Kalulushi Concentrated Solar Power Station: Location: Kalulushi District, Expected Capacity: 200 MW.

## Some of the notable solar companies (plus brief details on what they do)

Some of the notable solar companies (plus brief details on what they do):

- Suntech Appropriate Technology Ltd: Specializing in small, medium, and large scale solar, power back-up, and hybrid solar systems.
- Solar Macs Energy: Supplies and installs solar panels and various solar products.
- ZamSolar: Provides end-to-end solar solutions.
- SunnyMoney: Largest seller of solar lights and phone chargers in Africa.
- Greenfields Energy Corporation: Develops on and off-grid solar systems and water pumping systems.
- Muhanya Solar: Supplies and installs renewable energy systems focusing on solar and wind.
- Captain Electrical: Specializes in solar lights for Government Institutions and Residential areas.
- Fenix Intl: Offers expandable solar home systems, impacting over 1.5 million lives.



## ABOUT THIS REPORT

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All market data, analysis, and conclusions follow JvG's internal consulting standards and international PV market research practices.

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# About J.v.G. Technology GmbH

J.v.G. Technology GmbH is a European engineering and advisory specialist for solar production lines and manufacturing equipment, supporting investors and operators with market, location and production-focused decision frameworks.

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