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Botswana 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.

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

KEY POINTS

All figures have been converted into USD

Yearly sunshine (sun hours per year)

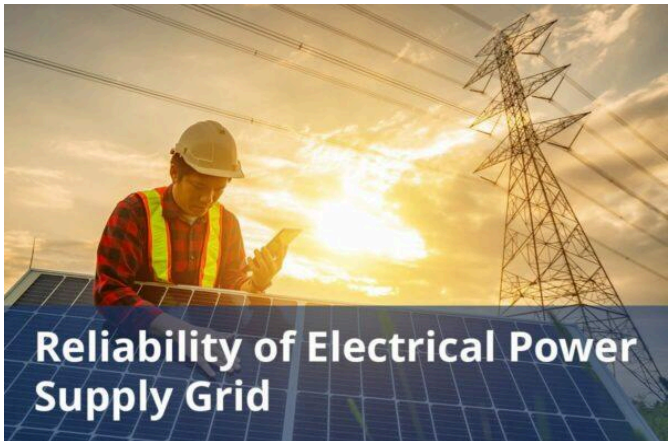
The weather varies by region and season; however, Maun, Botswana, receives an average of about 3332 hours of sunshine per year, which translates to roughly 9 hours of sunlight per day.

kWh per kWp installed

In Botswana, the specific yield for solar photovoltaic (PV) systems, which is the amount of electricity generated per kilowatt peak (kWp) of installed capacity, ranges from 1600 to 2000 kWh per kWp annually depending on factors such as location, system orientation, and overall efficiency.

Average cost per kWh from utility company

As of September 2024, the average cost of electricity in Botswana is approximately $0.095/kWh for households and $0.113/kWh for businesses. These prices include all components of the electricity bill, such as the cost of power, distribution, and taxes.



Reliability of electrical power supply grid

The reliability of Botswana's power supply grid has been improving, yet challenges persist. The Botswana Power Corporation (BPC) manages the grid, which is partly dependent on electricity imports. There are ongoing efforts to enhance grid stability and reduce power outages, particularly through infrastructure upgrades and diversifying energy sources. Despite improvements, rural areas still experience more frequent disruptions compared to urban centers.




DETAILED INFORMATION

All figures have been converted into USD

Total solar panel production capacity (installed)

As of 2023, Botswana had a total installed solar energy capacity of only 6 MW.

Total solar panel production capacity (projected)

According to a 2017 report by ENEA, Botswana could have up to 233MWp for off-grid solar power and potentially up to 1000MWp of on-grid solar plants by 2030. These estimates are very optimistic, though, and the real results could vary wildly.

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

In Botswana, the current average costs of electricity generation sources are not readily available.

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

According to the IEA, in 2023, around 98.9% comes from coal and 0.8% comes from oil.

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

The current average daily availability of electricity from the national grid in Botswana is not readily available; however, available information indicates that Botswana experiences challenges with consistent electricity supply, including load shedding and unexpected power cuts.

Number of residential solar panel installations

By 2024, the exact number of residential solar panel installations in Botswana isn't readily available from a single source.

Total number of solar farms (installed and projected)

Botswana has a few installed solar farms and multiple proposed solar farms.

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

Current Demand
- Rural Electrification
- A substantial portion of Botswana's population lives in rural areas with limited access to the national grid.

Growth Projections
- The off-grid solar market in Botswana is expected to grow significantly over the next decade.

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

While specific figures on the current demand for on-grid solar panels in Botswana are not readily available, the demand is steadily increasing due to the factors mentioned above.

The focus on large-scale solar projects and government support suggests that this demand will continue to grow as Botswana aims to meet its renewable energy targets.

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

Skilled Technicians and Installers
- USD 375 to USD 750.

Engineers and Project Managers
- USD 750 to USD 1,500.

Unskilled Laborers
- USD 190 to USD 300.

Population of the country

The population of Botswana is approximately 2.52 million people.

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

Energy Cost
- In Botswana, the levelized cost of energy (LCOE) of the installed solar farms is unclear; however, for the planned solar projects, it is expected to range between $0.08 and $0.10/kWh.

Labour Cost
- Skilled Technicians and Installers: USD 375 to USD 750.

Rent
- The cost for factory space in Botswana vary depending on the location, size, and specific features of the property which varies from $870 to $3,870 per month.

A summary of the energy infrastructure

Traditional Energy Sources
- Coal
- Botswana has abundant coal reserves, and coal-fired power plants are a major source of electricity. The Morupule B power station, with a capacity of 600 MW, is the largest, although it has faced technical challenges.

- Diesel
- There are two diesel power plants, Orapa (90 MW) and Matshelagabedi (70 MW), used primarily for emergency power.

Renewable Energy Sources
- Solar
- Botswana is investing heavily in solar energy. Botswana has a host of huge solar projects in planning and construction stage.

Some of the government regulations surrounding solar panel production

Rooftop Solar Programme
- The government has established guidelines for the Rooftop Solar Programme, which allows end users to generate their own electricity and sell any excess to the Botswana Power Corporation (BPC).

Permitting and Licensing
- Solar panel installations must go through a permitting and licensing process. This ensures that installations meet the required technical standards and safety regulation.

Technical Standards
- All solar PV systems must comply with the relevant connection specifications of BPC, the Botswana Bureau of Standards, and internationally recognized PV installation standards.

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

Mega Solar Project
- In collaboration with Namibia, the African Development Bank, and other international partners, Botswana is working on a Mega Solar project aimed at generating 2 to 5 gigawatts of solar power.

Rooftop Solar Programme
- This initiative encourages households, commercial, and industrial sectors to install solar panels.

Notable solar projects in the country (installed and projected)

Mmadinare Solar Complex
- This is the largest solar project in Botswana, with a total capacity of 120 MW.

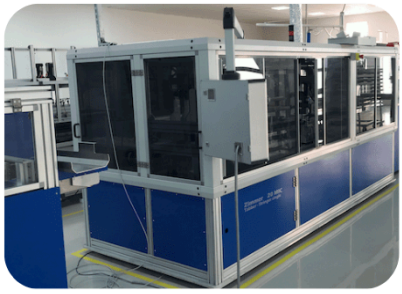
Jwaneng Solar Project
- This 100 MW solar PV project is part of Botswana's efforts to increase its renewable energy capacity.

Mini-Grid Projects
- Botswana is developing several mini-grid solar PV systems in various villages.

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

SolarBW
- Overview: SolarBW is a leading solar power energy company in Botswana and South Africa. They offer full turn-key solar power solutions, including the design, installation, and distribution of high-quality solar systems.

The Solar Zone
- Overview: Based in Maun, The Solar Zone focuses on supplying and installing solar equipment, primarily in Ngamiland but also across the country.



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.

REFERENCES

All References

For a detailed list of references and additional information, please visit our website with the current report at:
https://www.pvknowhow.com/solar-report/botswana/

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.
www.jvg-thoma.com

Contact & Further Information

For further discussion or clarification of manufacturing-related aspects, please contact:

J.v.G. Technology GmbH
www.jvg-thoma.com
info@jvg-thoma.com

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