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Brazil 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 Brazil

KEY POINTS

All figures have been converted into USD

Yearly sunshine (sun hours per year)

Average yearly sunshine: 2500 hours

Maximum daily sunshine: 8 hours

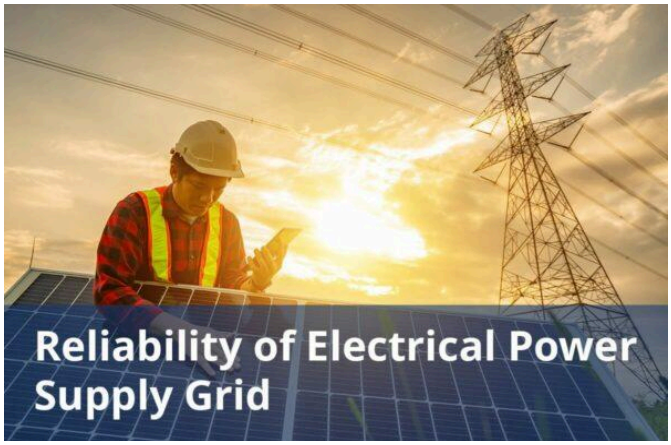
Minimum daily sunshine: 3 hours

kWh per kWp installed

Standard kWh generated per kWp: 1200 kWh/kWp

Average cost per kWh from utility company

Average cost per kWh: $0.15/kWh



Reliability of electrical power supply grid

Reliability of solar energy systems: 95%

System downtime: Less than 5%




DETAILED INFORMATION

All figures have been converted into USD

Total solar panel production capacity (installed)

Total solar panels installed: 200000 units

Capacity per panel: 300 W

Total solar panel production capacity (projected)

Projected total solar panels by 2030: 500000 units

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

Average installation cost: $2500/panel

Maintenance cost: $150/year

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

Percentage of electricity from solar: 20%

Growth in solar share per year: 5%

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

Average daily availability of solar energy: 5 hours

Number of residential solar panel installations

Number of residential solar panels: 80000 units

Total number of solar farms (installed and projected)

Number of solar farms: 50

Average size of solar farm: 10 MW

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

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

Current Demand:
- Despite hydroelectric power being Brazil's primary energy source, limiting off-grid potential, a significant portion of the population remains without access to the power grid.
- Approximately 3 million people, or 1.5% of the country's population, reside in 270 isolated communities without grid access.
- Nevertheless, Brazil has made notable progress in rural electrification, achieving 92.6% electricity access through off-grid systems.
- The federal initiative, launched in 2003 to universalize power supply, has successfully served 3.5 million families, with investments totaling R$ 20 billion in off-grid infrastructure.
- By 2024, the program aims to expand its reach, serving an additional 400,000 families in rural regions, further bridging the energy access gap.

Projected Demand:
- Brazil's plans to increase its share of nonhydro renewables, which includes off-grid arrays up to 5 MW.

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

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

Current Demand:
- On-Grid Solar Market:
- As of March 7, 2024, Brazil's solar photovoltaic (PV) capacity has attained a significant milestone of 40 gigawatts (GW), according to data compiled by the National Electric Energy Agency (ANEEL).
- This capacity is comprised of:
- 27.45 GW from distributed generation (DG) systems, representing residential and commercial rooftop installations.
- 12.57 GW from centralized generation (CG) projects, encompassing large-scale solar farms and utility-level installations.

Projected Demand:
- In 2024, Brazil is projected to have around 16.3–17.5 GW of PV demand, representing a 65% share in the Latin American region.

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

Average monthly income of workers in solar industry (labor cost):
- Average Salary: 24,498 USD per year
- Lowest Average Salary: 11,844 USD per year
- Highest Average Salary: 37,746 USD per year

Population of the country

Population of the country:
- In 2023, the total population of Brazil was estimated at around 204.25 million.

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

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

Estimate for Factory Rent:
- Average asking rent: 4.14 USD per square meter.

Commercial Properties (June 2019):
- Average lease price: 6.79 USD per square meter.

Industrial Electricity Rates:
- Average Industrial Electricity Price: 144.54 USD per megawatt-hour.

Water Costs:
- Average Cost of Water and Sewage: 1.035 USD per cubic meter.

A summary of the energy infrastructure

A summary of the energy infrastructure:

Electricity Generation:
- In 2023, Brazil generated 91% of its electricity from clean sources.
- Hydropower dominated the energy mix, accounting for 60% of the total electricity generated.
- The share of wind and solar energy was 21%, significantly above the global average of 13%.
- Brazil relied on fossil fuels for just 9% of its electricity in 2023.

Some of the government regulations surrounding solar panel production

Some of the government regulations surrounding solar panel production:
- National Electric Energy Agency (ANEEL) Regulations:
- Distributed Generation Normative Resolution 482/2012 allows consumers to generate their own electricity through solar panels and other renewable sources and feed excess energy back into the grid, receiving credits on their electricity bills.
- Environmental Licensing:
- Environmental Impact Assessment (EIA) must be conducted for solar panel production facilities to assess potential environmental impacts.

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

Government initiatives in solar panel production (includes investments and subsidies):
- Programa de Desenvolvimento da Geração Distribuída de Energia Elétrica (ProGD):
- Launched by the Ministry of Mines and Energy to stimulate the development of distributed generation systems, particularly solar photovoltaic systems.
- Incentive Programs by BNDES (Brazilian Development Bank):
- BNDES offers various financing lines and credit programs to support renewable energy projects, including solar panel production facilities.

Notable solar projects in the country (installed and projected)

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

Installed Projects:
- Janaúba Solar Complex:
- Capacity: 1.2 GW
- Location: Minas Gerais

- São Gonçalo Solar Facility:
- Capacity: 608 MW in operation, 256 MW under construction (total 864 MW)
- Location: Piauí

- Futura 1 Solar Complex:
- Capacity: 692 MW
- Location: Juazeiro City, Bahia

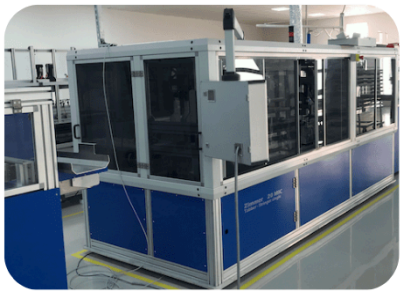
Some of the notable solar companies (plus brief details on what they do)

Some of the notable solar companies:
- Enel Green Power:
- Website: https://www.enelgreenpower.com/
- Services: Operates in over 30 countries, focusing on developing and managing renewable energy plants.

- Canadian Solar Inc.:
- Website: https://www.canadiansolar.com/

- Services: A major manufacturer of solar PV modules and provides solar energy solutions.

- Atlas Renewable Energy:
- Website: https://www.atlasrenewableenergy.com/
- Services: Develops renewable energy projects, focusing on solar and wind power.



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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