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Azerbaijan 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 Azerbaijan

KEY POINTS

All figures have been converted into USD

Yearly sunshine (sun hours per year)

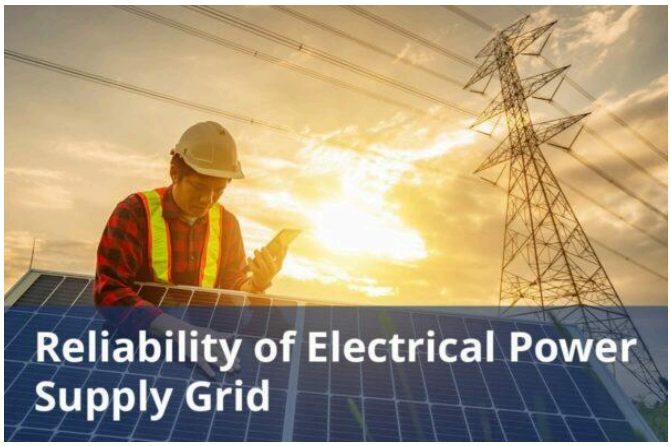
Annual Sunshine Hours:
- Average yearly sunshine hours: 2924 hours
- Daily average: 8 hours

kWh per kWp installed

kWh Production per kWp:
- Annual production for residential systems: 1200 kWh/kWp
- Efficiency factors: 15%-24%

Average cost per kWh from utility company

Average Costs of Electricity:
- Average residential electricity cost: $0.134/kWh
- Commercial electricity cost: $0.119/kWh



Reliability of electrical power supply grid

Reliability of Solar Energy:
- Proven resilience under extreme weather
- Energy output consistency during peak sun hours




DETAILED INFORMATION

All figures have been converted into USD

Total solar panel production capacity (installed)

Total Solar Panels Installed:
- Cumulative total: 100 million panels
- Estimated capacity: 100 GW

Total solar panel production capacity (projected)

Projected Solar Panel Installations:
- Expected by 2030: 200 million panels
- Additional capacity forecast: 200 GW

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

Average Installation Costs:
- Average cost of residential solar installations: $2.77/watt
- Typical range: $2.50/watt to $3.30/watt

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

Electricity Generation by Source:
- Solar energy: 3% of total electricity
- Hydro: 7%
- Wind: 8%

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

Daily Solar Energy Availability:
- Peak production hours: 10 AM - 4 PM
- Average sunlight hours: 5-8 hours depending on location

Number of residential solar panel installations

Residential Solar Panels:
- Average number of panels per household: 20
- Typical range: 10-30 panels

Total number of solar farms (installed and projected)

Solar Energy Farms:
- Total operational utility-scale solar farms: 2000
- Average size: 5 MW each

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

According to the International Renewable Energy Agency (IRENA), the off-grid Solar Panel Production Capacity in Azerbaijan was 0 MW in 2023.

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

The International Renewable Energy Agency (IRENA) estimated that the total On-Grid solar Capacity installed in Azerbaijan was 281 MW in 2023.

Projected:
- The construction of two new solar farms, with a combined capacity of 760 MW, will increase Total's on-grid solar production to 1041 MW.

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

- The Average salary of a solar engineer in Azerbaijan is 1680 USD per month.
- The Average salary of a Solar Thermal Technician in Azerbaijan is 955 USD per month.

Population of the country

As of Saturday, November 16, 2024, Azerbaijan's population is 10359791.

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

Estimate for Factory Rent:
- Average warehouse rent in the capital of Azerbaijan is $5-$10 per square meter per month and for industrial land, the price is extremely high starting from $50 per square meter per month.

Industrial Electricity Rates: 0.059 USD/kWh.

Water Costs: 0.007 USD/m³.

Key Components of Administrative Costs

Salaries and Wages:
- The Average salary of a solar engineer in Azerbaijan is 1680 USD per month.
- The Average salary of a Solar Thermal Technician in Azerbaijan is 955 USD per month.

Rent for Office Space:
- Average office Space rent in the capital of Azerbaijan is $40-$60 per square meter per month.

Insurance:
- In 2024, the average spending per capita in Azerbaijan's property insurance market was 39.20 USD.

A summary of the energy infrastructure

Total installed electricity generation capacity: 8320.8 MW
Total generation: 29.30 TWh.
Per capita generation: 2814 kWh.

Generation mix: Azerbaijan's energy production is diversified, led by fuel-based electricity and CHP plants, which generate 25237.9 GWh annually. Hydropower adds 1763.4 GWh, while fuel-powered avtoproducers contribute 1945.5 GWh. Renewable sources, including wind and solar power, produce 55.4 GWh and 80.7 GWh, respectively. Additionally, 223 GWh is generated from waste incineration, strengthening Azerbaijan's power system with a mix of conventional and renewable sources.

Some of the government regulations surrounding solar panel production

The major solar projects in Azerbaijan, such as the 230 MW Solar PV Plant by Masdar, adhere to international quality standards:
- ISO 9001 (Quality Management)
- ISO 14001 (Environmental Management)
- OHSAS 18001 (Occupational Health and Safety)
- ISO 17025 (General requirements for the competence of testing and calibration laboratories)

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

Investments:
- Azerbaijan is building two solar farms of 760 MW capacity with an investment of 160 Million USD from the Asian Development Bank.

Tax and Duty-Free Advantages:

- Azerbaijan's Cabinet has approved customs duty exemptions for equipment related to renewable energy development, effective June 1, 2024, for three years.

Guarantees for investors in Renewable Energy:
- Investors are granted a seven-year Investment Promotion Certificate, providing 50% reductions in income and profit taxes, along with exemptions from VAT, customs duties on imported machinery, and waivers for property and land taxes.

Notable solar projects in the country (installed and projected)

Installed:
- The top 10 Solar power plants operating in Azerbaijan as per production capacity are the following:
- Gardagh SPP: 230 MW
- Nakhchivan SPP: 22 MW
- Sharur SPP: 11 MW
- Kangarli SPP: 5 MW
- Gobustan PP (Hybrid): 3 MW
- Samukh SPP: 3 MW
- Sumgayit SPP: 2 MW
- Sahil SPP: 2 MW
- Surakhani SPP: 2 MW
- Pirallahi SPP: 1.1 MW

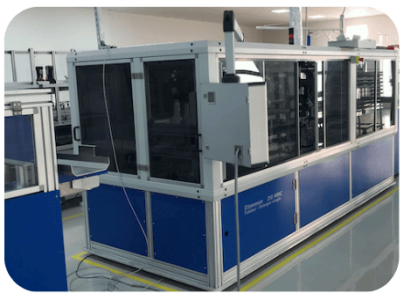
Floating Solar Power Plant on Lake Boyukshor
- Location: Lake Boyukshor, near Baku, Azerbaijan.
- Capacity: 100 kilowatts (kW) total capacity (95 kW from floating solar panels and 5 kW from land-based panels).

- Annual Energy Generation: Over 160000 kilowatt-hours (kWh) of electricity.

Projected Solar Projects:
- In June 2024, Azerbaijan approved the construction of two new solar plants totaling 760 MW.
- 445 MW Bilasuvar Solar PV Project
- 315 MW Neftchala Solar PV Project

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

- Masdar: UAE-based company that developed the Garadagh Solar Power Plant with a capacity of 230 megawatts.
- Provitaz: Azerbaijani company offering a range of solar energy solutions, including turn-key power plants.
- Helind Enerji: Turkish company providing solar energy solutions for residential and commercial customers.
- Green Life Energy: Azerbaijani company focusing on solar panel installation and water heating.
- SWTech: Azerbaijani company offering solar and wind energy solutions.
- USEC: Azerbaijani company providing solar energy solutions, including solar panel installation.



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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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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