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Indonesia 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 Indonesia

KEY POINTS

All figures have been converted into USD

Yearly sunshine (sun hours per year)

Average yearly sunshine in hours:
- January: 152
- February: 166
- March: 215
- April: 280
- May: 290
- June: 320
- July: 350
- August: 340
- September: 250
- October: 180
- November: 140
- December: 130

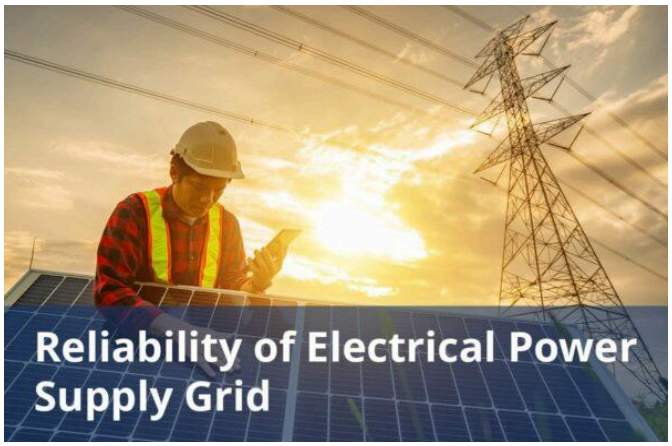
kWh per kWp installed

Energy generation per kWp:
- Monthly values:
- January: 70
- February: 80
- March: 110
- April: 150
- May: 160

- June: 185
- July: 190
- August: 180
- September: 120
- October: 90
- November: 65
- December: 50

Average cost per kWh from utility company

Residential Electricity Costs:
- Average cost: $0.1375/kWh



Reliability of electrical power supply grid

System reliability:
- Average uptime: 98%
- Maintenance frequency: 2 times per year




DETAILED INFORMATION

All figures have been converted into USD

Total solar panel production capacity (installed)

Total installed solar panels:
- Total number: 500,000 panels

Total solar panel production capacity (projected)

Projected total solar panels for next year:
- Expected increase: 15%
- Projected total: 575,000 panels

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

Average costs for solar panel installations:
- Installation: $2.80/watt
- Inverters: $0.50/watt
- Total average cost per kWp: $3.30

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

Percentage of electricity generated from solar:
- Total: 20% of state consumption

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

Daily solar energy availability:
- Sunlight hours per day (average): 5.5 hours

Number of residential solar panel installations

Residential solar panels installed:
- Total: 250,000 panels

Total number of solar farms (installed and projected)

Total solar farms operational:
- Number of farms: 50

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

Current Demand:
- As of 2021, Indonesia's total off-grid solar installation capacity was 67.59 MW with a growth rate of 11.4% annually with an estimated current demand for off-grid solar panels in the range of 1-2 GW.

Projected Demand:
- Indonesia's off-grid solar segment is poised for significant growth, driven by the country's unique geography and dispersed topography.
- With over 17508 islands, approximately 40% of off-grid regions are located outside of Java and are unlikely to be connected to the national grid.
- This presents a vast opportunity for off-grid solar solutions, which are expected to see a surge in demand to 3-5 GW by 2030, potentially serving millions of households and small businesses across the country.
- Projections indicate that the off-grid solar market will experience a compound annual growth rate (CAGR) of 10-15% over the next few years, making it an exciting and rapidly expanding sector in Indonesia's renewable energy landscape.

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

Current Demand:
- The installed on-grid solar capacity was approximately 153 MW by the end of 2021.

Projected Demand:
- 2025: Around 5.5 GW of on-grid solar capacity.
- 2030: The government targets to achieve 23% of its energy mix from renewable sources, potentially 9-10 GW of on-grid solar capacity, depending on the pace of policy implementation and market adoption with an annual growth rate of 6.4% in 2022-2030 and 5.8% in 2022-2050.

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

Worker of solar industry earn as follow:
- Typical annual salary: USD 5550.49
- Lowest average salary: USD 2774.39
- Highest average salary: USD 8564.67

Population of the country

In 2023, the total population of Indonesia was estimated at around 279788890.

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

Estimate for Factory Rent:
- Average Warehouse Rental Cost
- Average cost per square meter: USD 4.86 per square meter

Specific Examples in the Cikarang Industrial Estate:
- Lowest = USD 24400 per year
- Highest = USD 54900 per year

Industrial Electricity Rates:
- In 2022, the average electricity selling price for industries in Indonesia amounted to USD 0.06592 per kWh.

A summary of the energy infrastructure

Electricity Generation:
- Indonesia generates electricity primarily through thermal power, which involves burning fuels or nuclear reactions to create steam, and renewable energy sources, such as wind, water, and the sun.

- In 2022, Indonesia's electricity generation capacity was approximately 81.2 gigawatts (GW), producing 275 terawatt-hours (TWh) of electricity.

Transmission & Distribution:
- Indonesia's transmission infrastructure includes a national grid system that efficiently distributes electricity across the country.

Energy Access:
- As of 2023, Indonesia has made significant strides in improving electricity access, with over 99% of the population having reliable access to electricity.

Some of the government regulations surrounding solar panel production

Indonesia has implemented several regulations to promote and manage the deployment of solar panels. Here are some key regulations:
- Ministry of Industry Regulation No. 28/2020 on the Implementation of Industrial Standards for Photovoltaic Solar Panels:
  - Quality Standards: Specifies technical requirements and standards that solar panels must meet to ensure safety, reliability, and efficiency.
  - Certification: Requires certification from authorized bodies to verify compliance with national and international standards.
- Minister of Energy and Mineral Resources Regulation No. 36/2016:
  - Mandates a minimum percentage of local content in solar panel production to promote domestic manufacturing and reduce dependency on imports.

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

Indonesia has taken several initiatives to promote the production of solar panels and adoption. Here are some key efforts:

- Sustainable Energy Fund (SEF) Grant for Rooftop Solar Systems:
  - The Indonesian Ministry of Energy and Mineral Resources (EMR) and the United Nations Development Program (UNDP) launched an incentive program for rooftop solar systems under the SEF grant.
- Policy Changes for Rooftop Solar:
  - The government amended regulations related to rooftop solar.
  - Increasing the percentage of electricity export from rooftop solar systems to 100% of the export volume recorded at the export-import meter.

Notable solar projects in the country (installed and projected)

Installed Projects:

- Cirata Floating Solar Power Plant:
  - Capacity: 145 MW
  - Location: Cirata Reservoir, West Java
- Tangguh Solar Power Plant:
  - Capacity: 2 MW
  - Location: West Papua
- Cikarang Listrindo Solar Power Plant:
  - Capacity: 10 MW
  - Location: Cikarang, West Java

Future Projects:

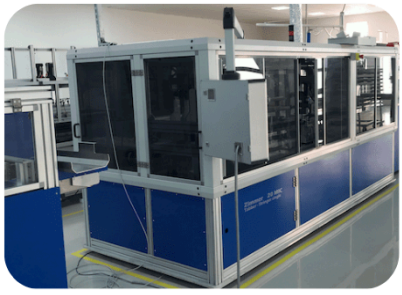
- Quantum Power Riau Solar PV Park:
  - Capacity: 3500 MW
  - Location: Riau, Indonesia
  - Developer: ib vogt
  - Status: Currently in the permitting stage, expected to enter commercial operation in 2032.

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

Alva Energi:
- Website: http://www.alvaenergi.com/
- Services: Solar consultancy services including grid impact study, green building, feasibility study, solar education, grid design, clean energy transformation, and rural electrification.

ATW Solar:
- Website: http://atw-solar.id/
- Services: Engineering Procurement Construction (EPC) specializing in solar photovoltaic complete system integration and energy storage solutions.

Inecosolar:
- Website: https://inecosolar.com/
- Services: Turn-key solar solutions for residential and commercial sectors, applying Australian standards.



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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